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The International Journal of Orthodontia Oral Surgery and Radiography

A Monthly Journal Devoted to the Advancement of the Sciences of Orthodontia, Oral Surgery and Dental and Oral Radiography

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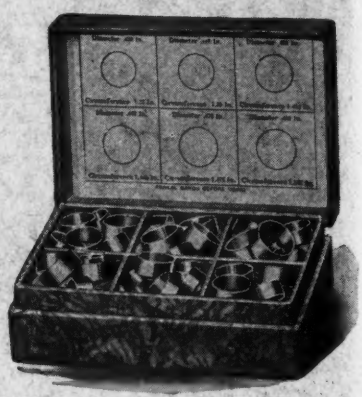

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VOL. XIV ST. LOUIS, AUGUST, 1928 No. 8

ORIGINAL ARTICLES

PRESIDENT'S ADDRESS*

BY L. M. WAUGH, D.D.S., F.A.C.D., NEW YORK CITY

THE Constitution of our Society prescribes that the president shall deliver an address at the annual meeting. I presume that each one in turn wishes that it were not required, as at the end of one's tenure of office it seems more fitting that the outgoing president remain silent while the members pass judgment upon his administration. However, the duty is a pleasant one as it suggests that he become circumspective; and if perchance his soul be brave, he may even venture to make suggestions for the future.

This Society was organized in 1921 as the result of a growing consciousness for the need of a society in which the specialists in orthodontia might regularly exchange ideas and work together for the study and advancement of orthodontia. As the result of a preliminary conference called by William C. Fisher, eight founders formed the Society and soon forty-one names were enrolled as charter members. The goodly number and the spontaneity of the response evidence the need for the society and its sphere of usefulness has extended rapidly. In the following year twenty-two members were elected; in 1923, fourteen names were added to the list; in 1924, seven; in 1926, twelve; in 1927, two, and during the present year twenty-eight applications have been received, much the largest number in any one year. Fourteen of these have been voted into membership, the other applicants' names now being in the hands of the Board of Censors. The total active membership list has been one hundred and twenty. There have been only two resignations and one death, making a *net* membership of one hundred and seventeen, this being the largest sectional society of orthodontists in the world.

*Read before the New York Society of Orthodontists, New York City, March 14, 1928.

The efforts of our members to contribute to the quality of our own programs have been noteworthy, but have not ended here, as their contributions to National meetings and the International Congress have been conspicuously outstanding. The winning of the President Eby Cup in the Clinic Contest at the last meeting of the American Society of Orthodontists, is but one evidence of cooperation and ability.

While the influence upon our local members has been one of broadening the scientific vision and stimulating rather more uniformity in practice, the benefits have not ended here. The spirit of good-fellowship and better understanding of one another has been a factor of more importance than is oftentimes realized. The judgment which I form of my fellow practitioner stands out to me above any opinion that may be expressed by a prospective patient. I, personally, have come to feel that it is never wise to put much dependence in the criticism voiced by the patient of a fellow practitioner, and the more harsh the criticism, the less dependable the opinion. As we come together at our society meetings, the personal contact with my confrerés leads me to know them well and to be in a position to defend adverse criticism voiced in an unfair manner. The influence also upon the profession in general, and upon public opinion toward orthodontia has been progressive. During the past year your officers have endeavored to make the members of the dental and medical professions, especially of the First, Second, and Ninth Districts feel welcome at our meetings. To this end, the monthly bulletins of these societies have carried statements of our meetings urging all who are interested to attend. Notices of our programs in the public press have helped to educate the people. The noteworthy success of the Conference Course given to the members under the direction of Dr. Mershon, ably assisted by Doctors Ross and Eby, has proved to be an outstanding event in the efforts of the year. From general reports of those who took the course, it would seem wise to suggest that this means of serving our members be repeated in the year ahead. The essays and the discussions of the year, we believe, have served the important dual purpose of stimulating the biologic concept of orthodontia and of proper principles of treatment. From them the studious member must have been impressed by the fact that the true orthodontist must reason in terms of biology and treat in terms of mechanico-therapeusis and that every result brought about involves a series of vital changes in the tissues which, to be safe, must be produced within the physiologic limit. A reporting agency has been employed to make verbatim reports so that our deliberations may be put into the literature. May I suggest that to this end it would seem best to have an editor whose specific duty it shall be to supervise the collection and preparation of our proceedings for prompt and proper publication.

The ethical concept of our members, we hope, also, has been improved. The opinion of Doctor Hinman, as expressed at the December meeting concerning the reprehensible practice of fee-splitting and the discussion which followed, we trust did must to make clear the moral side of the question. There is also a legal side of grave import. In answer to a letter of inquiry sent by me to the State Department of Education, the following was received:

The University of the State of New York
The State Department of Education
State Board of Dental Examiners

March 7, 1928

Dr. L. M. Waugh,
576 Fifth Avenue,
New York City.

My dear Dr. Waugh:

Fee-splitting is a nefarious practice and the member of any profession guilty of such practice should have his license revoked, whether he be a member of the dental, medical, or any other profession. In my opinion, it is one of the grossest offenses constituting unprofessional conduct, and there would be no hesitancy on the part of this Department in instituting proceedings against the dentist who is guilty of participating in such a practice.

In my opinion the hold-up man has more honor than a man who extracts an excessive fee from an individual seeking medical relief for the purpose of dividing it with another member of the same or another profession. You are at perfect liberty, if you desire, to quote me on this matter.

With sincere personal regards, I am

Very truly yours
(signed) Minor J. Terry,
Secretary.

There can surely remain no question in the mind of any one as to his ethical and legal duty.

The amendment to the Constitution which we have just passed, making eligible for membership only those who are engaged in the *exclusive* practice of orthodontia, is proper and consistent with the aims of the organization. The minimum period of two years of exclusive practice for eligibility seems best for the present. However, we are firmly of the opinion that with the rapid growth of the specialty which is just ahead, the interests of organized orthodontia will be best served by having the American Society of Orthodontists organized as are the American Medical Association, and the American Dental Association, each component sectional society being a part of the National body, membership in which will be obtained only through joining the sectional society. When this time shall come, the minimum period for eligibility will have to be increased to three years.

At times in our earlier meetings, I have wondered where active and capable men would come from for the future safety of the society, but as I have become more closely acquainted with the younger members all my fears have been allayed. There are very many whose greeting of orthodontia is of the noblest and who have only to be given opportunity for development, not only to maintain our present standards but to keep them in the forefront of progress with advancing years. It behooves us all to stimulate the younger men to cast aside hesitancy, to contribute to our programs and to accept official responsibility. The more experienced will, I know, help in a spirit of utmost kindliness, to the end that this Society may extend its sphere of usefulness by helping to provide a higher type of service for many more growing children.

In conclusion, I want to thank my fellow officers, the essayists, discussors, and all those who contributed directly and indirectly to the success of the year's proceedings. My especial thanks are due to the members of the Executive Committee, particularly Doctor Howes, the capable and hard-working chairman, also to Doctor Eby for much help in many ways, and to Doctors Mershon and Ross for the willing contribution of time and energy most unselfishly given in conducing the course, and lastly, to all of the members who have by suggestion and loyal attendance cooperated to make my year in office a pleasant, and I hope, a successful one. In appreciation, may I again pledge my continued loyal support to the officers of the future, and my willing adherence to the ideals of the Society.

GLEANINGS FROM THE MEMBERS OF THE JANUARY CONFERENCE CONDUCTED BY THE NEW YORK SOCIETY OF ORTHODONTISTS, UNDER THE DIRECTION OF DR. MERSHON AND HIS ASSISTANTS*

By Ashley E. Howes, D.D.S., New Rochelle, N. Y.

IN THE desire to return to the society as a whole the material substance resulting from the recent conference, conducted by the society under the direction of Dr. Mershon, each member of that conference was asked to write a summary of what seemed to him the high lights, the outstanding or most impressive points brought out in the course. The following is a compilation of the thoughts expressed in these individual gleanings.

At the outset of the course, Dr. Mershon stressed the point that his intention was not merely to teach us a technic for making a mechanical appliance, but to try to convey to us his conception of the orthodontic problem. It was to try to make a mechanical appliance fit in as nearly as possible with his ideas that the lingual arch was evolved. Dr. Mershon felt that unless we first became cognizant of this fundamental conception of orthodontia, then the knowledge of mechanical technic of constructing a lingual arch and auxiliary springs would be of small benefit. The problem must be stated before it can be solved.

Dr. Mershon said that in developing his conception of the orthodontic problem, he had gained invaluable aid from Conklin's "Heredity and Environment in the Development of Man." The following quotations from that authority are most significant:

"One of the greatest and most far reaching themes which has occupied the minds of men is the problem of development."

"In general, the normal development of any part is dependent upon its proper nutrition, and this is dependent upon the functional activity of this and other related parts."

*Read before the New York Society of Orthodontists, New York City, March 14, 1928.

"The development of functions goes hand in hand with the development of structures; indeed function and structure are merely different aspects of one and the same thing, namely, organization."

Quoting from Davenport's "Experimental Morphology" he gave us the following definition of growth:

"Growth is response to stimuli. Hitherto we have regarded the process of growth in too mechanical a way, as certain nutritive compounds passing into a chemical mill to be inevitably transformed at a certain rate into protoplasm or formed substance. We have now to recognize that growth processes are essentially vital processes, and, as such, characterized by all that complexity which we find in such a vital process as response to stimuli."

He also quoted from Tyler's "Growth and Education" the following pertinent statement:

"The human body is an exceedingly complex structure. Many organisms must originate, grow, develop, and be coordinated and adjusted in one body. We often forget or underestimate the importance of growth. If an organ is undersized, it is a source of weakness in the body. This is evident of heart and lungs, but equally true of all organs. Bone and muscle must grow well in the child before they can be developed and hardened by the boy and girl."

And so, in studying the oral cavity, we must study it in its relation to the other organs of the body. It is affected in its growth, and develops just in proportion as we have normal or abnormal function of the associated organs.

The tooth on erupting has no power of directing itsef into normal occlusion. It can only occupy such position in the dental arch as the associated tissues, together with the developing bone in which it is located, place it. The malposition of a tooth may be largely established before the tooth starts to erupt. With these thoughts in mind, Dr. Mershon stated his problem in these words: "Malocclusion is the result of functional disturbance in bone development and all associated tissues, plus heredity. The orthodontic problem is not a tooth problem. It is a growth problem, and the machinery involved in growth with all its complexities is the phenomenon which induces a tooth to change its position, the appliance being only an aid in so far as it produces a stimulus."

Thus orthodontia must be practiced according to biologic laws. We do not manufacture growth with our appliances. Uniform results are not obtainable. It is impossible to obtain 100 per cent correct occlusion in a great number of cases. Heredity establishes a limit in the possibilities of treatment.

There is always an attempt on the part of nature to develop towards the normal. During one of the evening sessions, Dr. Mershon demonstrated this by showing two cases, in one of which the maxillary molars had been moved backward, and the other, the anterior teeth carried forward, both movements having been accomplished with similar appliances.

He demonstrated the fact that, after all, nature decides how far we will get with orthodontic treatment by showing two similar cases, both treated in similar manner, in one of which he obtained a fair result at the end of seven years, and in the other an excellent result at the end of eighteen months.

Tooth movement should not exceed the rate of growth, as a tooth changes its position as a result of growth processes.

Coming to a mechanical appliance which will aid us towards this end, the lingual arch with auxiliary springs was presented, but in presenting it. Dr. Mershon emphasized the fact that he had no panacea for all our orthodontic woes.

In carrying out orthodontic treatment, the all important fact to be borne in mind is that it should not be continuous, but should be done in stages of active treatment, interspersed with periods of rest, with the teeth free from all appliances. The duration of such periods depends entirely upon the individual case. Teeth are never to be left harnessed in a mechanical appliance over a long period of time. Appliances are to be left off as much as possible. As a general rule, Dr. Mershon leaves his appliances off about 50 per cent of the time.

Cases which have been under treatment for a long period of time and have reached a stage where we do not seem to be accomplishing much except holding the food against the teeth by means of appliances, will be found to respond to our treatment if given a period of rest.

Cases are diagnosed from individuals, not models. We cannot tell from stage to stage what will be the next step. After each rest period, the case is rediagnosed, and treatment planned accordingly.

We all know that we have in children periods of rapid growth, and periods of retarded growth. An average child grows most rapidly at birth, and decreasingly so up until the ninth or tenth year. Then there is a period of retardation for about three years, and then a second period of growth around pubescence. Dr. Mershon feels that most cases cannot be finished before this period. In other words, the average case cannot be finished until fourteen to eighteen years.

Bearing in mind these different periods of growth, it becomes apparent how necessary it is to periodically remove all appliances, and allow natural adaptations to take place. An orthodontic appliance fixed to the teeth over a long period of time may do more harm than good. This is one evil of orthodontia.

Concerning the amount of force to be used in an orthodontic appliance he said that the ideal would be that amount which corresponds with the normal growth force in developing bone, but this we have no means of measuring; so the smallest amount of pressure we can apply and control, which will cause bone development and cause the tooth to change its position, would approximate the normal force of development as closely as it is humanly possible to estimate it.

By applying too much pressure, we can exceed the normal rate of growth, and by holding this movement with retainers, establish a tissue disharmony which may be worse than the original condition.

Conversely, cases treated along the lines laid down by Dr. Mershon need no retention. Placing a retainer is making a confession that we have estab-

lished a disharmony. Thus we have the answer to the question, "What causes a tooth to remain in the position it finally occupies?"

These two factors are responsible:

1. Heredity.
2. Functional adaptation.

Dr. Mershon drove this home by placing on a placard which was constantly before our eyes, the following orthodontic epigram:

"You can push teeth to where you think they belong. Nature will move them to where they will best adapt themselves to the rest of the organism."

At the risk of being criticized for too much repetition, I am going to read verbatim extracts from several of the letters received.

Here, as in orthodontia, you will see individual response to a given stimulation, the stimulation in this instance, of course, being mental.

Short, but right to the point is this one sentence reply from one of the members:

"The recent course given by Dr. Mershon has forcibly impressed upon my mind to treat cases biologically, so nature will move the teeth to where they will best adapt themselves to the rest of the organism, and has equipped me with the means by which this may be best accomplished."

Here are extracts from one that responded more at length, adding several pertinent thoughts to those expressed by Dr. Mershon:

"The inherent function of all life, while young, is to grow. Growth is one of the most difficult processes to control or limit. We cannot make a person grow taller simply by feeding him more. We ought to remember this when we insert appliances and think that we are always going to produce growth. We generally can move teeth, true enough, but we cannot always produce growth. We should recognize this fact, and remember we have limits which generally depend upon what is normal for the individual.

"In our zeal to do a great deal for our patient in the shortest possible time, we have lost sight of the fact that teeth can be moved only at the growth rate normal for that individual, without injury to the cells of the investing tissues. Often men move teeth not only too fast but to positions far beyond the normal for the age of the patient and therefore produce a disharmony in the teeth and jaws as bad as that which existed before the treatment was instituted. Such conditions are clearly indicated in cases which readily relapse upon removal of appliances. Surely does this not show how the tissues suffered under treatment? How much better is the treatment of gentle, steady pressures, which move the teeth slowly, in preference to intermittent positive pressures?

"We have attributed many of our failures, and those cases which respond very slowly to treatment, to the difference in individuals. Since our attention has been called to the rest periods which nature takes in her rate of growth, does it not follow that if we are to work with nature, we should confine our efforts in the stimulation of growth to the periods of accelerated growth? Every effort should be made to coordinate the periods of artificial stimula-

tion by appliances with that of accelerated growth, and the rest periods of treatment with those that nature takes during the growth of the patient.

"We must not overlook the beneficial effects of functional activity upon growth. Function stimulates growth, and appliances which during treatment interfere with the function of the teeth and jaws, are less efficient. The athlete stimulates growth and strength by function and increased demands. The appliances should be so planned as to permit free functional activity, which is wonderful aid and influence to our side.

"The best treatment for conditions of malocclusion should be based upon gentle stimulations applied at periods of accelerated growth, with rest periods in treatment corresponding to those which nature takes and, at all times, not interfering with regular functional activity. This plan will produce results which are more satisfactory and natural looking, results that do not have an orthodontic appearance. Dr. Mershon stressed the point that he did not produce 'orthodontic mouths' with his methods of practice. Surely, since we are all striving for the best results, we should abandon this 'hurry up' type of treatment, which so often produces artificial looking effects.

"This plan of treatment practically eliminates retention periods and wearing retainers. The teeth are moved not merely through the bone but sufficient growth of the bone is produced equal to the movement of the teeth.

"After a consideration of Dr. Mershon's theories of practice, one understands how adaptable the lingual arch appliance is to his needs.

"Its simplicity, flexibility, inconspicuousness, and, above all, the advantage of applying it to the lingual surfaces of the teeth, have contributed to its great popularity. It does not limit the natural forces of growth or interfere with functional activity of the jaws or teeth.

"In everyday practice most men are inclined to overoperate their appliances. It is always very tempting to give the springs a 'twist' at each visit of the patient. By so doing, we defeat the main object of the procedure by trying to hurry the work along. I think this may be accounted for by the fact that, when we adjust the springs in a desire to increase the pressure, we unconsciously change the direction of the force, so that the tooth really takes a zigzag course as it travels to its new position."

Another member said that he was greatly impressed by Dr. Mershon's warning of the possible complication to the growing organism involved in any orthodontic interference in the deciduous arches, and the idea that such interference should occur only when there is a definite lack of function present, such as a Class 2 or 3 case.

Here is another one sentence review:

"The salient points of the course to me are briefly that a slow treatment should be carried on by means of gentle force, chiefly derived from auxiliary springs, interspersed with periods of rest from mechanical pressure. By this plan a physiologic growth will be induced, which will be in harmony with the physiologic age of the patient, and which will require no mechanical retention."

From another:

"It was quite a surprise to me to note that the 'average case for treatment cannot be finished before early adolescence—or right after pubescence.' The time factors mentioned here directly reflect the next point Dr. Mershon emphasized, namely, 'You should not move teeth at the age of ten where they normally should be at the age of sixteen. If you do, and hold them with retainers, you establish a condition of tissue disharmony, and you may be further from the end of treatment than before you started. This disharmony thus established may be worse than the original malocclusion.' "

"Dr. Mershon dropped this thought provoking statement also: 'Heredity establishes a limit in the possibilities of treatment.' Orthodontia is a problem in biology. To know Dr. Mershon is to know his concepts of treatment which are: No treatment should be continuous. It should be divided into stages, and you should rediagnose treatment at the end of each stage. Enumerated below are other impressive points:

"Tipping means too rapid movement: Teeth move a long time after the force of the appliance is spent. Growth is inherited. Teeth will not stay in contact with foreign objects, viz., partial plates, because bone is plastic. One cause of relapse is overdevelopment. Appliances should be used to stimulate growth. Let reaction move teeth. A tooth changes its position as a result of growth processes."

From another:

"My impressions from Dr. Mershon's course can be listed under the following headings: (1) Time of treatment; (2) appliances; (3) method of treatment.

"(1)) The time of treatment as to age and stage. Baby cases should not be treated unless there is an extreme condition. The normal development and eruption of teeth is periodic. We do not know the normal rate of development for any individual—therefore orthodontia should be attempted in stages. A general correction of the entire malocclusion should not be undertaken at one time.

"(2) The slogan on appliance seemed to be simplicity, the lingual arches being made in smooth curves and not bent to fit the irregularities.

"(3) The treatment consisted of operating the springs only once in two to six months."

From another:

"I will mention a few thoughts even if given in a rambling way.

"The simplicity of appliance.

"The fact that teeth have individual freedom of movement during orthodontic treatment with this appliance.

"The dividing up of the case into certain stages with definite steps, and rest periods between the stages.

"The development of functional retention rather than mechanical support.

"The differentiation of treatment in certain types of unilateral distoclusion. These aside from:

"The technic of appliance construction.

"Then the attitude of Dr. Mershon, his willingness to serve, freedom from dogmatism, open mind and democratic association; his desire that members should get a fundamental conception of orthodontia in relation to body processes, and that they should strive to produce a physiologic unfolding of the arches rather than a forceful and arbitrary movement of the individual teeth; and his mental questioning as to whether he was giving his all, and whether it was being received by each; signs of a noble and self-sacrificing nature."

This last letter that I am going to read, while quite short, touched on so many of the important points that it might be well to read the whole letter.

"In reviewing the course given by Dr. Mershon last month it seems to me that an enumeration of the statements made by him, around which the whole course was built up, is most essential.

"The following are some of them:

"(1) Orthodontia is not a tooth problem. Malocclusion is the result of functional disturbance in bone development with all associated tissues, plus heredity.

"(2) There is always an attempt on the part of nature to develop toward the normal of that case.

"(3) It is possible to do harm with orthodontic appliances.

"(4) It is the vital processes in a developing child which causes teeth to change their position and not appliances.

"(5) You can push teeth to where you think they belong; nature will move them to where they will best adapt themselves to the rest of the organism.

"(6) No two cases ever respond to the same treatment in the same way.

"(7) Treatment should not exceed the rate of growth. You should not move teeth at one age where they would not normally be until another. If you do, and hold them there with retainers, you are establishing a condition of tissue disharmony that may be as bad as the original disharmony, and you may be further away from the end of the treatment than at the start.

"(8) Treatment should be taken up in stages, not continuous.

"(9) The average case needing treatment cannot be finished until the early adolescence stage (fourteen to eighteen years of age).

"While of course the principles underlaying the whole subject are of paramount importance, it is essential that we be able to apply our knowledge in terms of appliances which we must use to accomplish our results. I think that our technic was helped immensely by the demonstrations and actual work that we did in the laboratory.

"Many valuable points of diagnosis and treatment were brought out.

"One important point was a proper diagnosis of cases that are sometimes classed as distoclusion where one or both of the maxillary canines are crowded out of the arch and the molars and premolars have drifted forward. It is important to determine whether the molars and premolars have drifted forward or whether it is a true distoclusion case.

"If the molars and premolars have drifted forward and you treat the

case by moving the maxillary incisors forward and bringing the mandibular arch forward, your result will give you what Dr. Mershon terms the 'orthodontic mouth.'

"The two evening sessions at which cases treated and under treatment were taken up, were extremely valuable. The advisability of treating cases in stages was most beautifully brought out in case after case. To treat our cases with the minimum amount of interference with appliances is, in my mind, real orthodontia."

In reading these letters, I realize that I have repeated certain points again and again, but they seemed so important that I think they bear repetition. I also realize that I have probably failed entirely to mention other vital points touched on during the course, but perhaps there has been enough brought out to give a great many of us a helpful and different outlook on our work.

CONCERNING ORGANS AFFECTING THE ERUPTION OF HUMAN TEETH*

By Charles F. Bödecker, D.D.S., F.A.C.D., New York City

Professor of Dental Histology and Embryology Columbia University Dental School, New York

LITTLE is known concerning the force effecting the eruption of the teeth and still less of the cause of this phenomenon. In certain cases teeth are retained even though they have sufficient space to take their place in the arch. Robinsohn of Vienna has developed a theory which deserves further consideration, a theory which seems to explain a number of problems in this connection. In the introduction of his last contribution: "Hormonale Morphogenes der Zaehne"[1] he states that in order for a theory to be valid, it must explain all different phases of a problem and there is no doubt that in theory at least, he succeeds in doing so.

Before however, analyzing this theory, we must briefly consider the embryologic formation of the teeth and surrounding tissues.

EMBRYONIC FORMATION OF THE TEETH

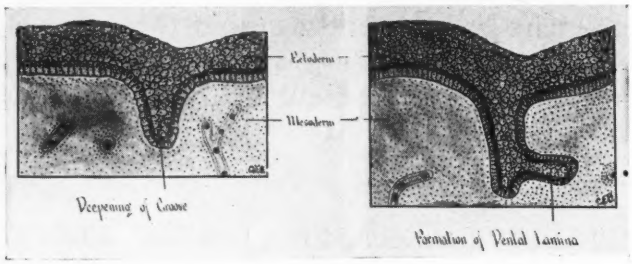
Ectodermic Formations Leading Up to the Development of the Enamel.[2]— The embryonic development of the teeth is rather a complicated procedure, the ectoderm going through various complex forms. Although these differ in the various animals, one or more sometimes being omitted in the formation of the tooth germs, it has been considered advisable to systematize this procedure. The succesive changes in the form of the ectoderm are the following:

(1) Dental ridge.
(2) Dental groove.
(3) Dental lamina.
(4) Enamel organ.

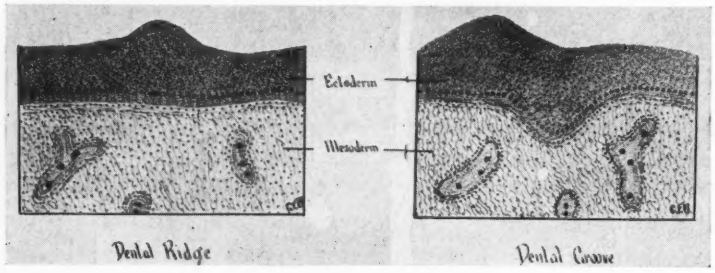
*Read before the New York Society of Orthodontists, New York City, March 14, 1928.

First Formation of Ectoderm, Dental Ridge.—At the sixth week, the ectodermic cells covering the jaws proliferate and heap up, forming a continuous ridge over the site of the maxillary and mandibular teeth (Fig. 1). This ridge is not as well developed in mammals as in some of the lower animals and seems to be a remnant of free tooth formation as is the case in a now extinct group of fishes (Ganoids) where the entire body was covered with hard scales, similar in structure to teeth.

Dental Groove.—Almost simultaneously to the formation of the dental ridge, the dental groove is developed in the mesoderm by a burrowing down of



Figs. 1 and 2.



Figs. 3 and 4.

Figs. 5 and 6.

the ectoderm cells into the underlying embryonic connective tissue (Figs. 2 and 3). On the lingual side of the dental ridge, on the surface, a slight furrow is formed over the underlying groove in the mesoderm.

Dental Lamina.—The dental lamina is formed by a further proliferation of the cells of the ectoderm, filling in the dental groove of the mesoderm, in a lingual direction, this forming a continuous shelf beneath the surface of the maxilla as well as of the mandible (Fig. 4).

Enamel Organ.—At ten nearly equidistant points of the dental lamina, on the sites of the future deciduous teeth, a still further proliferation of the

cells, forms shafts which sink into the depths, resembling simple tubular glands (Fig. 5). These finger-like projections, surrounded by the mesoderm, enlarge at their extremities and become bulbous, later acquiring the shape of bells (Fig. 6). These form the enamel organs of the deciduous teeth, each of which is connected with the surface by a strand of ectoderm tissue filling the groove, all together called the cord of the enamel organ.

Dentinal Papilla.—At the same time the cells of the mesoderm proliferate beneath the future enamel organ, invaginating the bulbous mass of ectoderm

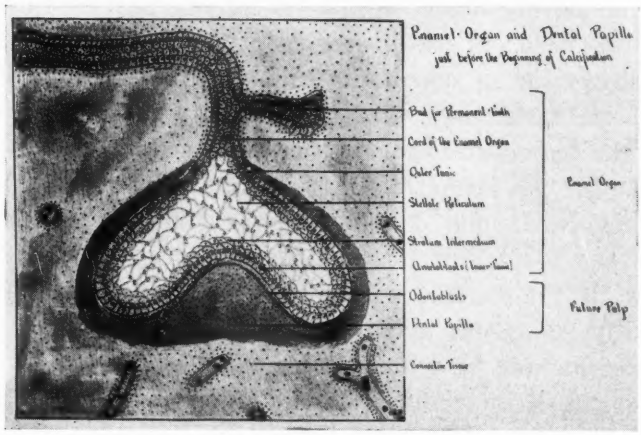


Fig. 7.

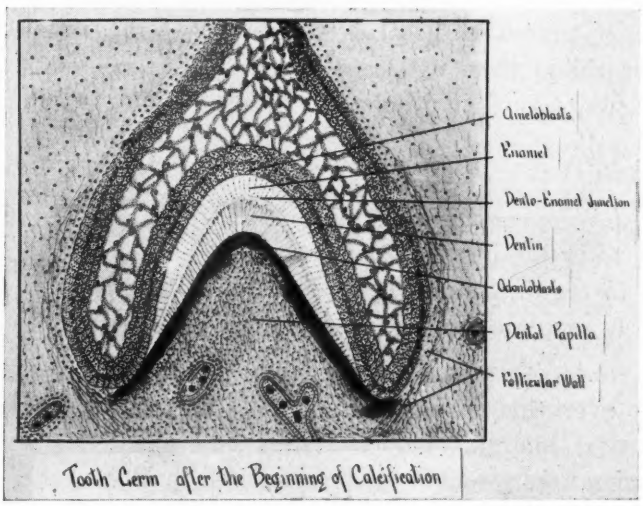


Fig. 8.

cells and changing the latter to the form of a bell. These mesodermic cells develop the dentinal papilla which is the dentine forming organ (Fig. 7).

Beginning of Calcification.—In the period, from the sixth to the sixteenth week after conception, the above described changes take place, i.e., the dental ridges, dental grooves, dental laminae, enamel organs and the dental papillae are formed. Then, at the sixteenth week, the calcification of the dentine and enamel of the deciduous teeth commences. The dentine is the first of the dental tissues to be laid down, the calcification commencing at the summit of

each cusp at the line which forms the future dentino-enamel border. As soon as the narrow zone of dentine is developed, the enamel is formed upon this cone of dentine (Fig. 6). The direction of formation of these two tissues is diametrically opposite, the enamel being formed from within-outward and the dentine from without-inward.

THEORY OF ROBINSOHN

With this knowledge of the embryologic formation of the teeth I will turn to the theory of Robinsohn. The existence of the epithelial structures in the peridental membrane have long been known but no theory concerning their function has been generally credited. Noyes believes them to be concerned in the formation of cementum but states that we know little as yet about the epithelial structures. In Europe they are considered to influence the shaping of the crown and roots of the teeth and pathologists believe them to be responsible for the formation of cysts, but even this is denied by certain authorities. Now Robinsohn develops the feasible theory that these structures influence the movement of the teeth through the bone, thus causing their eruption. If, he further maintains, the epithelial structures do not function normally, the tooth may lie dormant in the bone and thus it does not erupt. The manner in which Robinsohn supposes these structures to effect the movement of the tooth is by the secretion of a hormone under control of the endocrine glands which stimulates bone resorption.

THE IMPORTANCE OF THE EPITHELIUM

If this theory proves to be true, we find that the epithelium is a much more important tissue than we have heretofore suspected. We know that healthy ectodermic tissue (epithelium) is responsible for the formation of:

(1) well-calcified, caries resistant enamel;

We suspect that it influences the:

(2) development of well-formed contours of the crowns;

Robinsohn adds two other factors:

(3) to regulate the eruption of the teeth and

(4) to regulate the relative position of the teeth in the jaws.

MALFUNCTIONAL EPITHELIUM THE CAUSE OF MANY DENTAL DISORDERS

In looking over this revised list of functions of the epithelium and its derivatives (dental lamina, enamel organs and epithelial structures of the peridental membrane), we note that according to Robinsohn a derangement of this tissue may cause the most, if not even all of the dental diseases. The activities of the entire dental profession with its many specialties is occupied with repairing the ravages of dental caries and its resultant loss of teeth, the correction of malocclusions and the treatment of periodontoclasia. Robinsohn is, therefore, adding to the already great responsibility of healthy epithelium of forming caries resistant enamel, the additional responsibility of causing malocclusions. Every observant dentist knows that both malocclusions as well as the tendency to dental caries is steadily increasing in civilized nations and we must, therefore, exert every effort to discover the cause of this increase if we wish to feel that we are doing our share in the world's work.

ERUPTION OF THE TEETH

Preparatory to discussing the theory of Robinsohn, let us regard the two most common theories concerning the factors causing the eruption of the teeth. Gottlieb, Erheim, Sicher and others believe in two such factors: (1) The growth of the root; (2) the pressure caused by the dentinal papilla.

(1) *Growth of Root.*—In considering the embryologic development of the tooth, we note that the crown is formed first and the root is later completed. The apex is, in fact, not fully formed until some time after the eruption of the tooth (Fig. 9). There is no doubt that the progressive lengthening of the root will slowly force the developing tooth out of the bone and thus effect its eruption. Robinsohn, however, does not regard this as the principal factor in the eruption of the teeth, for he very properly cites cases (it is true, rare and abnormal) in which a retained tooth with a fully formed root may erupt.

(2) *Pressure of the Dentinal Papilla.*—The dentinal papilla which forms the young dentine and is later transformed into the pulp of the tooth, is a highly vascular organ, situated at the base of the partially formed tooth (Fig. 9*a-d*). We can imagine that an increased blood pressure in this embryonic connective tissue, can exert force upon the overlying tooth and thus cause its eruption from the bony crypt.

Robinsohn, on the other hand, maintains that it is principally the growth of bone surrounding the apex under the influence of the epithelial structures which forces the tooth outward in conjunction with a progressive resorption of the bone round the crown, thus effecting the eruption of the tooth.

The ectoderm and its derivatives is marked, throughout the illustrations, as thick red lines or dashes, while the mesoderm is shown in black dots and lines.

DISTRIBUTION OF THE EPITHELIUM

Fig. 9 shows the progressive formation and eruption of an anterior tooth, which has been adapted from diagrams of Robinsohn. In Fig. 9*a* we note the ectoderm (red) which later forms the oral epithelium and we see vestiges of the epithelial cord of the enamel organ in the process of distintegration. Below we note a red structure which represents the enamel organ covering the partially formed enamel. The summit of the future dentine cusp, indicated by a few dentinal tubules, is being formed by the dentinal papilla shown in dots.

Robinsohn believes that the ectoderm is found, not only covering the enamel it forms, but that it also proliferates around the entire tooth germ. Whether this is the case further histologic investigation will have to decide. This rudimentary tooth, composed of enamel and dentine (with its enamel organ and dentinal papilla) is completely surrounded by mesodermic tissue which soon forms bone, thus enclosing the tooth germ crypt as seen in Fig. 9*b*. Here we note that the crown has been completely formed including a part of the gingival section of the root. The epithelial sheath of the crown (remnant of the ectodermic enamel organ) persists and is shown extending also below and around the active dentinal papilla. The tooth germ is entirely enclosed in a bony crypt at this stage, while Fig. 9*c* shows that the bone around the crown portion of the erupting tooth has been resorbed al-

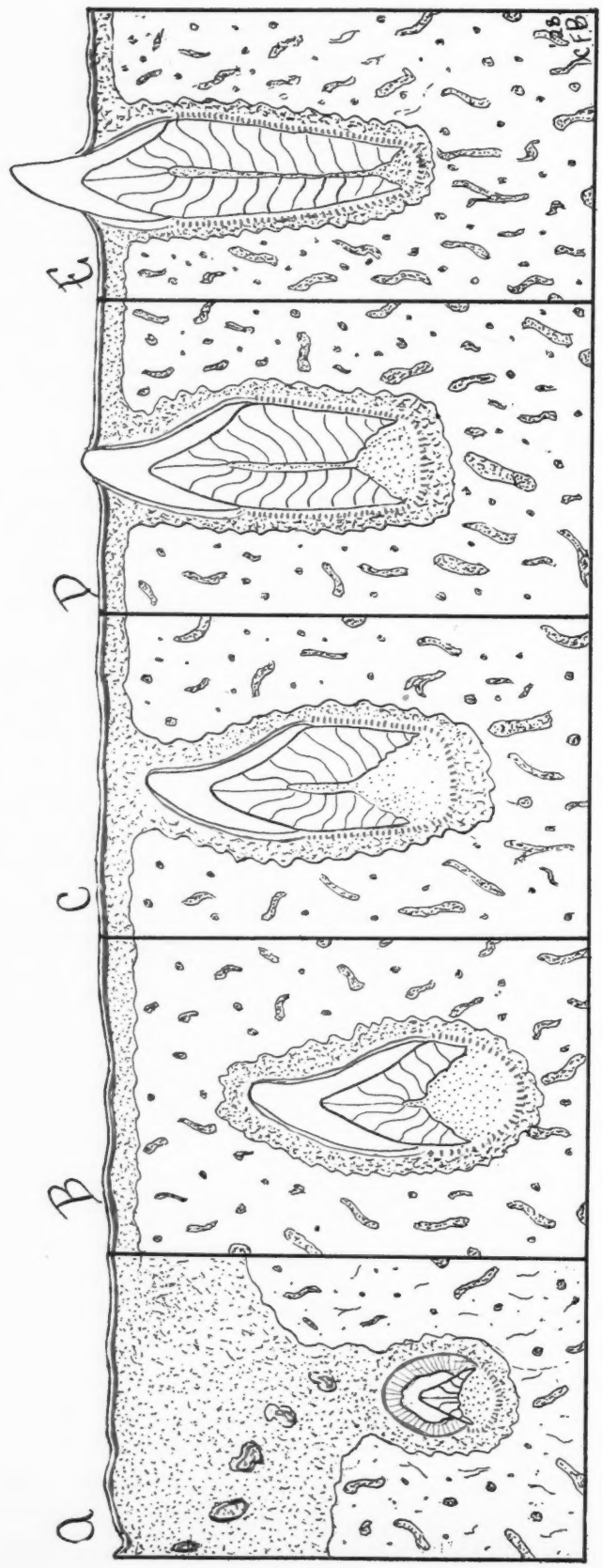


Fig. 9

lowing it to approach the surface. Fig. 9*d* shows the incisive edge of the crown piercing the oral epithelium and the apex of the root continues to form the motive power effecting the final eruption of the tooth.

ROBINSOHN'S THEORY COMPLETE

To state Robinsohn's theory briefly: He believes that the epithelial structures of the peridental membrane as well as the epithelial sheath of the crown are the agencies which control the resorption of the bone surrounding the tooth germ. He considers that these structures secrete a hormone under the control of the endocrine glands which hormone has the power to stimulate resorption

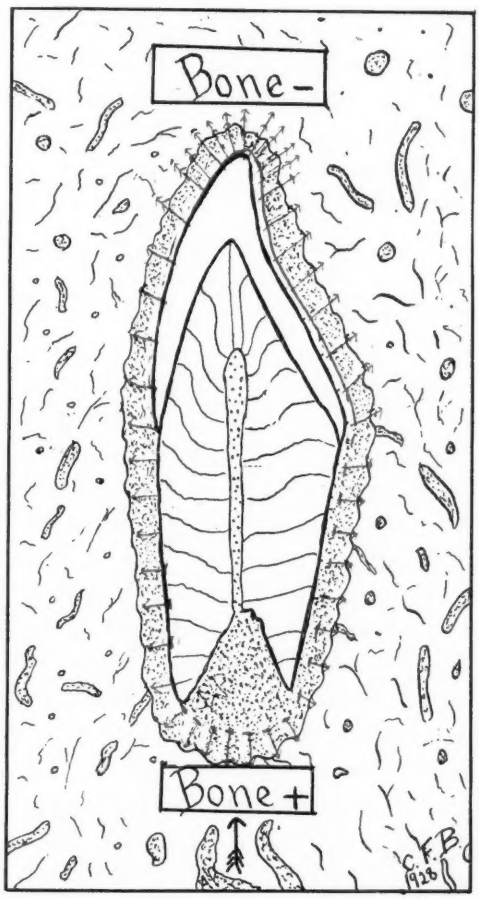


Fig. 10.

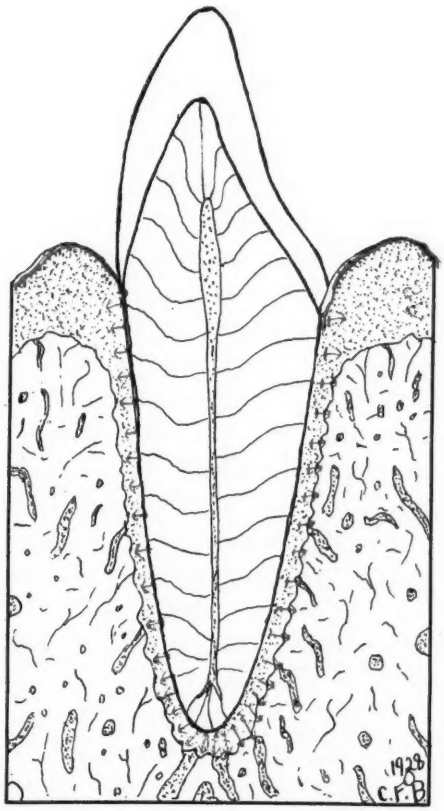


Fig. 11.

of bone. He believes that quantitatively the epithelial structures of the crown portion of the tooth are greater than those of the root portion and that, therefore, the bone around the coronal portion of the developing tooth is resorbed, thus forming a space and allowing the tooth to approach the surface. The inhibitory action of the hormone secreted by the epithelial structures around the end of the forming root is weaker, thus permitting the development of bone in this area and consequently forcing the tooth to erupt. As the tooth proceeds to the surface as (shown in Fig. 9*c*) it finally reaches and pierces the oral epithelium (Fig. 9*d*), which causes the epithelial sheath of the crown

to atrophy and to cease functioning as far as the endocrine activities are concerned. The epithelial structures of the root portion in the peridental membrane, on the other hand, persist throughout life and by the secretion of the hormone *prevent* the filling in of the alveoli with bone which would otherwise continue to extrude the tooth.

RÔLE OF EPITHELIUM IN ERUPTION OF TEETH

Let us now turn to a critical study of this subject. We will first consider that part which seems to me the most complex, that is the apparently variable action of the hormone. I wish to emphasize the fact that the following is purely theoretic on my part and that it requires the knowledge of one thoroughly versed in endocrine activity to check up its correctness. I will first state the facts at our disposal before attempting to correlate them and determine what takes place around an erupting tooth: Robinsohn claims: (1) that the epithelial structures of the peridental membrane are in connection with the endocrine glands; (2) that they secrete a hormone which induces a resorption of the bone; (3) that these structures are divided into two parts according to their location into: crown and root portion; (4) that quantitatively the structures in the crown are greater than in the root; (5) that as the result of number 4, the bone resorption qualities of the crown areas are more active than those in the root areas.

Deductions.—As the process of bone resorption is more active around the crown portion of the forming tooth, thus forming a space and taking into consideration the pressure of the forming root end and the vascular pressure in the dentinal papilla below, the tooth moves outward on its way to the surface (Fig. 10). At first glance we appear to have failed to explain the uninterrupted formation of bone around the apex which continues in spite of the inhibitory action of the epithelial structures in this area. If, however, we fundamentally believe in the possibilities of the epithelial structures secreting a hormone which stimulates resorption of bone and that, due to the increase in quantity of these structures in the coronal portion over those in the apical or root portion, the paradox of bone forming in spite of this action of the hormone in the apical portion may be explained as follows: In Fig. 10 we note the partially formed tooth enclosed in its bony crypt; the radiating red lines running from the tooth into the surrounding tissue represent the zone of influence, or the degree of penetration of the hormone, secreted by the epithelial structures which stimulate bone resorption. We note that in the coronal portion, they being present in greater quantities, this zone penetrates deeper into the surrounding bone than it does in the root portions of the tooth. As a result, the bone around the coronal part of the tooth is resorbed, while the area surrounding the apical portion of the root is built up to a point until it comes in *contact* with the zone of influence of the hormone secreted by the epithelial structures of the peridental membrane. As a result, therefore, of bone *resorption* around the coronal portions of the tooth and bone *apposition* around the apical area of the root, the tooth is forced to erupt.

Fig. 11 shows the fully erupted tooth. The red lines radiating from the root to the surrounding bone indicate again the zone of influence of the hor-

mone of the epithelial structures of the peridental membrane; a condition that Robinsohn maintains persists throughout life. And here comes, to my mind, the really ingenious phase of his theory, one which promises to explain the reason for senile extrusion of the teeth. He believes that bone has the tendency of filling in all spaces in its structure and that if it were not for the epithelial structures of the peridental membrane with their effect of stimulating the resorption of bone (to a limited depth, and therefore inhibiting the formation of bone) the tooth would continue to erupt at its previous rate and be exfoliated in a short time.

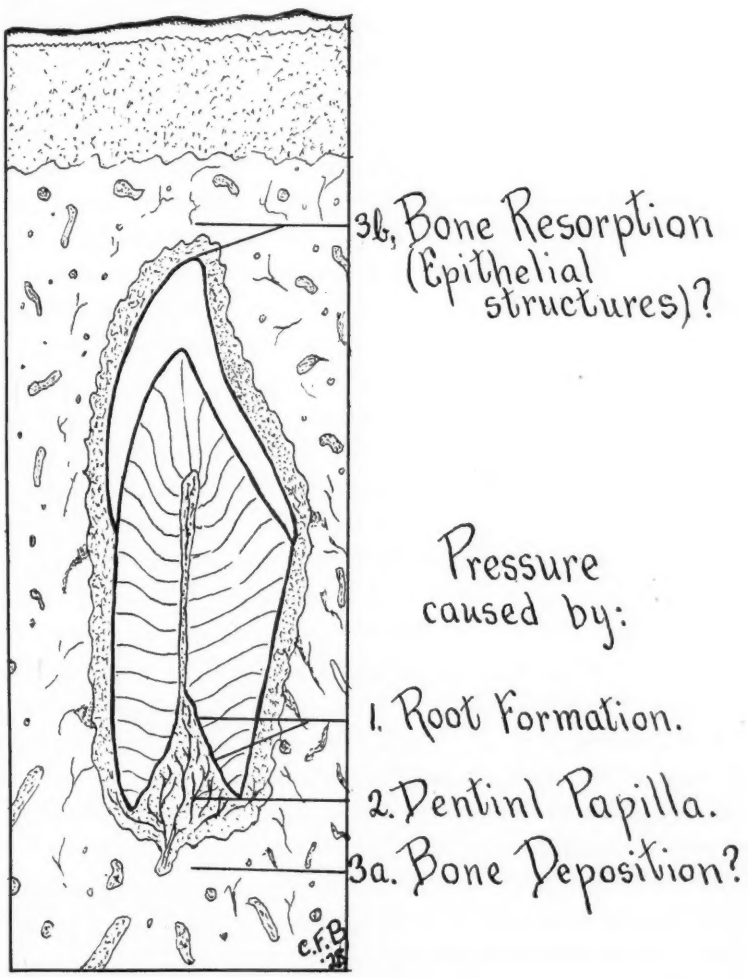


Fig. 12.

The light that the theory of Robinsohn throws upon the manner in which the eruption of the teeth takes place is indeed welcome, if proved to be true, but his theory does not concern itself only with the eruption of the teeth but with the various other phenomena which have puzzled the orthodontist and biologist for a long time. Such phenomena are, for instance, the retention of submerged teeth, malposed teeth, the senile extrusion of the teeth, the formation of cysts, etc., etc. Even though a discussion of these various phases would be exceedingly interesting and profitable, I will not go into them on account of lack of time.

The criticism that the theory of Robinsohn has received at the hands of the medicodental profession in Austria, has been drastic in certain instances, particularly that of Gottlieb and Sicher, and further investigation is required to ascertain the validity of the claims and counter claims advanced during their lengthy discussions.

ERUPTION OF TEETH CONSTANT

A few of these claims I wish to take up before closing as they have an intimate bearing upon some practical clinical points. You know that Gottlieb maintains that the tooth is in a state of constant eruption, from the time of its formation till its exfoliation. I believe he is correct in this contention only in that the rate of extrusion is surely greatly reduced after the appearance of the tooth in the oral cavity. If, however, Gottlieb believes this to be the case and considers that the force or eruption results from the pressure of the growth of the apex of the tooth and the tension of the dental papilla, I fail to see what power causes the tooth to continue to erupt. Peters calls attention to the fact that the causes of eruption have ceased to exist. In order, therefore, to explain the continued eruption of the teeth, it is necessary to find other causes to account for it and, therefore, Robinsohn's theory appears logical.

The controversy concerning Robinsohn's theory has become increasingly harsh and both sides have employed terms of cutting irony and bitter sarcasm which should find no place in a scientific discussion. I think we should regard every investigator as being sincere in his beliefs even though they may be incorrect and ill-founded and hard words will never convince him of his error. Such controversies, however, seem to have the purpose of attracting the attention of the profession at large, thus possibly accelerating the solution of the problem involved.

CONCLUSION

In conclusion I would like to mention some of the practical results which we may hope to achieve if Robinsohn's theory as to the mechanism of the eruption of the teeth is correct. If it is indeed true that a functional disturbance of the epithelial structures, in conjunction with the endocrine activity does retard the eruption of the teeth, then possibly some means of regulating such a condition will be found.

Another problem, which may be open to a like solution is the senile extrusion of the teeth, a condition which afflicts some of our patients as early as middle life. Here also, if Robinsohn's theory is correct in maintaining that this extrusion is often caused by a subnormal activity of the epithelial organs of the peridental membrane, a method may be evolved to stimulate these structures to their normal function once more.

Decisive means of stimulating the epithelial structures are not as yet definitely known; light therapy, however, promises results. In this connection proper dosage of the roentgen rays or possibly ultra-violet light will prove of benefit and thus be of value to many of our patients.

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MENTAL ORTHODONTIA*

By Russell E. Irish, B.S., D.D.S., Pittsburgh, Pa.

ALL of you have observed the setting sun and its rays reflected on the clouds, seemingly a complement of the spectrum. You were so greatly impressed by the fact that you saw interwoven in the spectrum an intangible something of which you had not before been conscious, prone to realize its beauty and parallel harmony of arrangement. Unfortunately man cannot organize to perfection, but unquestionably can and should work always with the thought in mind of utilizing any arrangement whereby his work can be made more efficient and beneficial in its application, and comparatively harmonious, as are the colors of the spectrum.

It is with the thought in mind of better enabling us to understand children, to be given better cooperation through proper suggestion, conversation and direction, that I am presenting this brief paper and accompanying slides. My attention was first attracted to the possibility of a classification of patients, A., B., C., through interest in two children under treatment. Temperaments, dispositions and mentalities all differ, but may in a sense have their parallelisms.

The existent malocclusions of the children I mention were of Class II, distoclusion, and Class III, mesioclusion. Their likes and dislikes were diametrically opposite, and created in me an interest causing me to observe other children; then with the measurement of time as an indicator came the thought that by associating mental differences with malocclusion we could arrange a classification of mental differences and compile a form of data of direct value to orthodontists.

My belief, beyond doubt, from continuous observation during the past year, both in my private practice and at the University of Pittsburgh, is that associated with malocclusion in its complexities we in turn find parallel mental characteristics and peculiarities, each with its distinct potentialities, deserving of a particular treatment for cooperation and results.

Interpret clearly my expressions, to this point, as I am not stating that a child having a tooth in labio-, mesio-, torso-, or infraversion, will have with each individual malposition a particular mental disturbance, but that it is unquestionably true that children afflicted with neutroclusion, mesioclusion and distoclusion have distinct mental differences as mentioned, necessitating for their cooperation distinct psychologic suggestions, conversations, etc.

After reading many of the modern publications dealing directly with the mental development, hygiene and intelligence of children, one is inclined to believe that the author's arrangement of chronologic data is based primarily

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on environment, with physical inequalities a secondary consideration—seemingly a lack of associated physical and mental differences. One author states frankly that infected tonsils and carious teeth are not factors directly contributing to mental differences. Apparently in the instance mentioned the secret is intelligence tests. According to modern logic this statement is not well founded as immaterial substance is not measurable.

It is reasonable to believe that an inequality of the physical body depending on its complexity and generality would affect mental progression or regression, and necessitate for cooperation in treatment some remedial measures.

A book that contains much valuable information, and considers the direct relation of the mind and body in their normal and abnormal states, is John B. Watson's book on "Behaviorism." While my knowledge of behaviorism is very limited, and although I am not a behaviorist, I believe Dr. Watson deserves much credit, for he has certainly done one thing—he has considered both mind and body in an associated manner.

Before studying and classifying patients in classes A., B., C., for convenience, cooperation given me by children was highly unsatisfactory for the reason that my forms of mental treatment were somewhat routine with few differences in suggestions. My conversations were of the nature that "Children are children," so handle them as such, not realizing that the maxim, "Children are children," really means that they have individualities which should be given consideration.

I was wasting much time telling Jack, John, Betty and Louise, that so and so equalled so and so. Therefore, much to my disappointment, I was given everything but cooperation. Children do not want prolonged elaborate explanations of your procedure. All they want is a clear explanation, given to suit their particular mental temperament, merely to understand, to be understood and to understand you, not continual disturbance through conversation, or disillusionment through suggestions. For example, "Be real good, this won't hurt, it will only take a minute," or "Now all we're going to do is so and so." It is my opinion that many of us have wasted too much time in trying to prepare children, when they, perhaps, were fully cognizant of the fact that we were more perturbed than they, with the result that we have so disgusted, or frightened them that they in self-defense realize they are masters of the situation and stop all progress.

Observation will teach us that children are sensitive, moody, susceptible to suggestions, stubborn, audacious, selfish, generous, biased and unbiased in opinions. Thus if we are considerate of the above mentioned differences, and have arranged a means, through classification, that directly considers them, we can certainly aid ourselves and the children materially, and in most instances wonderful cooperation ensues. They soon realize what it is all about with the result that it is really surprising how the little folks show their confidence and cooperation.

We must consider mental differences, i.e., temperament, sensitiveness, alertness, attitude, depressed and arrested development. Some children enjoy conversation, others do not want to be disturbed, and still others want

sympathy as you will see from the slides I present. Let us at this time briefly consider the "Mental Orthodontia" pertaining to Class II and Class III patients. To say that in suggesting or conversing with Class II or C. patients, for desirable results I would not apply Class II suggestions to Class III or B. patients with any amount of success. The slides will better enable you to understand the reasons.

There are mental similarities, as you will see from the slides, in all three classes, where a distinct line of difference could not be approached. However, if it is possible to arrange a classification that can be directly applied to each type, and as a result, offer positive remedies, then we will have fewer difficulties. If we are not forgetful in applying our treatment, remembering that children have alert active minds, our progress will be greater.

I have presented this paper in brief, with, as you will see, a more detailed description, and greater enlightenment to be had from the slides and the accompanying explanation.

Therefore, in conclusion, I mention the fact that "The finest lock is useless without its proper key." You realize in my classification of A. or neutroclusion, B. or mesioclusion, and C. or distoclusion, regarding cooperation, and associated data, that the classifications and deductions were compiled from one source only, i.e., observation, and my only proof, and answer for that proof, is results. If you are so inclined make note of the classifications and data, apply each in its respective place and I am sure you will be more than pleased with the result.

What I am presenting has been invaluable to me as an aid in understanding children, thus gaining their confidence and cooperation. May the same be of value to you, significant of fewer difficulties and better results. It is, in a sense, a key that unlocks the door of understanding and cooperation of children. It is my hope to offer more complete data at some future date.

In the following figures representing Classes I, II and III, or A., B. and C. patients, note that all classifications are divided as follows:

Sex, F. or M. _____ Age _____ Grade.
Mental,
Cooperation,
Pleasure,
Activities,
Answer.

These classifications and groupings were not given as mental tests, but merely as a means of determining mental alertness and formulating a method for better cooperation.

You will note from the concluding three figures comparative deductions with suggestive treatment.

Figs. 1 and 2.—Neutroclusion or Class I, showing marked similarity in classifications. Apparent mental alertness.

FIG. 1.—NEUTROCLUSION OR CLASS I.

Sex F. Age 9. Grade 5 A. Protruded maxillary anteriors. Mental—Active, alert. Cooperation—Good, willing. Pleasure—Swimming, reading. Activities—Play house. Answer—Promptly given.	Sex F. Age 10. Grade 6. Mutilated case. Mental—Active, alert. Cooperation—Good, insistence necessary. Pleasure—Play house, Play with dolls. Activities—Housework. Answer—Promptly given, slight lack of coordinate expression.
Sex F. Age 9. Grade 5. Mental—Uniformly active, Better concept. Cooperation—Good, always mentions any disturbance of treatment. Pleasure—Difficult to select. Outdoor life; nature. Activities—Nothing in particular. Answer—In a deliberate manner with definite clearness.	Sex F. Age 11. Grade 6 A. Mutilated case. Mental—Alert, active. Cooperation—Fair. Pleasure—Most anything. Activities—Housework. Answer—Slight lack of coordinate expression.
Questions, pleasure and activities asked not to test mentality, but alertness. Impossible, measure intelligence, immaterial.	

FIG. 2.—NEUTROCLUSION OR CLASS I.

Sex M. Age 7. G. C. Mental—Alert, active. Cooperation—Good. Pleasure—Baseball. Activities—School & outdoor work. Answer—Prompt, brief, clear.	Sex M. Age 11. T. P. Protruded maxillary anterior teeth. Mental—Very active and alert. Cooperation—Willing (forgetful) Pleasure—Swimming, baseball. Activities—No decision. Answer—Clear, concise way.
Sex M. Age 12. Grade 7. Retruded maxillary anterior teeth. Mental—Active. Cooperation—Good. Pleasure—Swimming, baseball. Activities—School. Answer—Clearly but more slowly.	Sex M. Age 12. Grade 8. B. G. Protruded maxillary anterior teeth. Mental—Active, alert, coordinate. Cooperation—Good. Pleasure—Swimming, reading, Activities—Cartoon drawing. Answer—Quickly, accurately.

FIG. 3.—DISTOCLUSION OR CLASS II.

Sex M. Age 13. Grade 2nd. yr. high. Width one molar, protruded maxillary anterior teeth. Mental—Slightly retarded. Cooperation—Fair, with frequent suggestion. Pleasure—After slight concentration—swimming. Activities—Work, P. R. R. Answer—Usually positive in thought and action, audacious in manner.	D. H. Sex M. Age 17. Grade Jr. High. Note Sr. Mental—Slightly retarded. Cooperation—Fair, constant suggestion necessary. Pleasure—Musical instruments. Activities—No definite answer; resents being asked. Answer—Because of question, audacious in manner.
Sex F. Age 14. Grade Fr. So. Hi. Slight protrusion maxillary anterior teeth. Mental—Slightly retarded. Cooperation—Poor, little response to suggestion. Pleasure—Perhaps swimming. Activities—None in particular. Answer—Audacious in manner—self-centered.	Sex F. Age 12. Grade 5-7. Mandibular teeth lingual to posterior teeth, maxillary anterior teeth protruded. Mental—Arrested development. (note; case very pronounced) Cooperation—Very poor. Pleasure—Reading Raggedy Ann Book. Activities—Sewing. Answer—Slow, self-centered and audacious manner.

Fig. 3.—Distoclusion or Class II, showing the classifications as previously mentioned, with apparent mental retardation.

Fig. 4.—Mesioclusion or Class III patients, showing marked difference when compared with Class I, and Class II patients.

Fig. 5.—Shows comparative deduction of Class I, neutroclusion or A. patients, with suggestive treatment.

Fig. 6.—Comparative deduction of Class II, or distoclusion patients as explained in Fig. 5, C. patients.

Fig. 7.—Comparative deduction of Class III, or mesioclusion, as explained in Fig. 5, B. patients.

FIG. 4.—MESIOCLUSION OR CLASS III.

J. W.	L. U.
Sex M. Age 17. Grade—Not attending. Maxillary teeth lingual to mandibular. Mental—Depressed, lack of mental coordination. Cooperation—Given because of satisfied attitude. Pleasure—Long hesitation, then answered football. Talks incoherently. Activities—Carpenter. Answer—Slow, not concise.	Sex M. Age 12. Grade 5-7. Maxillary teeth lingual to mandibular teeth. Mental—Arrested development, conscious of condition. Cooperation—Fair, lack of understanding as regards value of treatment. Pleasure—Nothing definite. Activities—Nothing definite. Age 14, marked mental and physical growth: more aggressive. So-Hi.
B. K.	**N. C.**
Sex F. Age 9. Grade 2B-A. Typical. Mental—Slight mental depression. Cooperation—Poor, no appreciation at beginning. Pleasure—Hesitancy before answering. Play in sand box. Activities—Dust. Answer—Slow, lack of concentration.	Sex F. Age 10. Grade 5-6B. Typical. Mental—Slightly depressed. Cooperation—Fair. Pleasure—No decision. Activities—Anything. Answer—Slowly, lack of concentration.

FIG. 5.—NEUTROCLUSION OR CLASS I.

Suggestions:

(a) Mental and physical alertness should be considered by operator.
(b) In conversation, talk of child's activities, pleasures, etc.
(c) Due to mental alertness avoid extensive conversation. (Talkative.)
(d) Occasional stern attitude (by operator) necessary.
(e) Clear, brief explanation of operation necessary when beginning treatment.
(f) In majority of cases avoid prolonged conversation unless child is insistent—disturbs child.

COMPARATIVE DEDUCTION WITH DISTOCLUSION—CLASS II; MESIOCLUSION—CLASS III.

(a) General mental alertness higher than Class II.
Physical alertness slight variance.
Class II. Higher mentally and physically than Class III.
(b) Initiative, sense of reason, higher than Class III.
Initiative, sense of reason, generally higher than Class II.
Class II concentrate single.
(c) Cooperation higher than Class II, Class III.
(d) Highly sensitive to irritation. For cooperation operator insistent. Higher than Class II—Class III. (Exp. Class III)
(plus and minus.)
(e) In general A. patients.

FIG. 6.—DISTOCLUSION OR CLASS II.

Suggestions:

(a) Inquire of interests, dwell on chief interest. Child pleased, usually dwells on subject.
(b) Occasionally inquire of new interests. Reaction as above.
(c) Usually self-centered. Interests few but intense. Consider same.
(d) Due to audacious attitude, more frank, matter-of-fact explanation necessary.
(e) Forceful explanation, briefly and frankly stated successful. Reason—audacious attitude.
(f) Briefness of conversation appreciated.
(g) Psychology: Assume, in a sense, the mental attitude of the child. (?)

COMPARATIVE DEDUCTION WITH NEUTROCLUSION—CLASS I; MESIOCLUSION—CLASS III.

(a) Slightly lower than Class I; above Class III mentally.
(b) Initiative slightly lower than Class I, higher than Class III.
(c) Cooperation slightly lower than Class I, higher than Class III.
(d) If dealt with *sternly* tolerance good (higher than Class I, lower than Class III).
(e) In general C. patients. Why?

FIG. 7.—MESIOCLUSION OR CLASS III.

Suggestions:

(a) Conversation general.
(b) Disposition of operator; sympathetic, kind. Reason—conscious of condition.
(c) Remarks, always in the positive. Reason, overcome consciousness. Realize importance of treatment, gain cooperation, relieve mental depression.
(d) Continuous suggestions for cooperation necessary, also for aiding mental condition.
(e) Frequent sympathetic explanations of treatment advisable.
(f) Conversation appreciated.

COMPARATIVE DEDUCTION WITH NEUTROCLUSION—CLASS I; DISTOCLUSION—CLASS II.

(a) Mental arrestment. Lower than Class I or Class II.
(b) Initiative than Class I or Class II.
(c) Cooperation lower than Class I or II. Exp.
(d) Tolerance higher than Class I or II.
(e) In general B. patient.

General Classification.

A. patients—Neutroclusion, Class I.
B. " Mesioclusion, Class III.
C. " Distoclusion, Class II.

REFERENCES

Terman: Intelligence of School Children.
Tuyler: Growth and Education.
Watson, J. B.: Behaviourism.

DISCUSSION

Dr. Williamson.—In answer to your question I would say that the classifications were not based on age or mentality, but mental alertness. The classifications were arranged in accordance with the types of malocclusions, i.e., I, II, III.

Dr. Eisenberg.—I have not rigidly classified any of the cases, as you know, there are exceptions to all rules and that immaterial substance is immeasurable. I think your suggestion of having the patients file drawings expressive of their thoughts, is very good and I am sure aids materially in gaining cooperation.

Dr. Herder.—Your consideration of the fact that children are small editions of grown-ups is very suggestive and should be, if considered, helpful.

Dr. Spencer.—I am much pleased to know that you forward, from time to time, post-cards and pamphlets to your patients. Certainly children appreciate receiving such cards, and it certainly adds a personal interest to which they are entitled.

Dr. Logan.—It is very gratifying to hear you say and agree that we should live, in a sense, as the children do, or better, in an atmosphere of children.

Dr. Irish.—In conclusion, I thank you all for the gracious manner in which you have received my presentation.

NOCTURNAL TOOTH GRINDING: A METHOD OF TREATMENT

By Moses Joel Eisenberg, D.M.D., Roxbury, Mass.*

IN THE last few years there has come to my attention many cases of nocturnal tooth grinding which have annoyed parents to such an extent that they have sought treatment to relieve that condition.

In order to best study these cases I at once ordered a general physical examination, including a report on the nervous system of the child. The majority of reflexes were observed. The outstanding features that indicate any endocrine disturbances were noted. The results briefly summed up showed that nocturnal tooth grinding was not necessarily an accompaniment of physical debility, nor was its presence an indication of nervous hypertension, or a result of endocrine conditions. Rather, it seemed to show that it was habit, pure and simple, which although present in the waking hours was slightly exaggerated during sleep because of the relaxation which the conscious mind received.

A careful study was made of the occlusion of these cases and as a result of this study many interesting observations were made concerning the development of the masticatory movements in the child. There has already been published an article on "Attrition in the Child." There is in preparation an article dealing with the movements of mastication. This will be presented for publication in a short time. The routine of treatment in these cases was as follows:

After all the data were collected, as before mentioned, the parents of the children were requested to watch carefully the movements of the jaws of the children during the interval that teeth grinding was observed, and they were requested to note the degree of protrusion either mesial or lateral, at the instant during which sound was emitted. Then, when the children were in the dental chair, the jaws were drawing in these similar excursions until either the same grinding sound was produced or the parents recognized the position. If the sounds were produced, they were followed directly to their origins and the teeth and cusps were carefully noted and marked.

At the same time all other excursions were tested to see if other movements would produce similar sounds. If the grinding sounds were not then produced the following method was tried:

A sheet of thick articulating paper or a piece of pink base plate wax was placed between the teeth; the jaws were first normally closed and the child instructed to press his teeth very firmly into the paper or wax. This paper or wax was then removed and examined for points which seemed to be longer than others. These sharp points were then rounded off until an even degree

*Fellow of the Harriet Newell Lowell Society for Dental Research of the Harvard University Dental School; Chief, Department of Dental Orthopedics, Forsyth Dental Infirmary for Children, Boston, Mass.

of pressure was noted when the jaws were made to bite into the articulating paper or pink base plate wax. The next step was the use of articulating paper only while the jaws were made to go through the various excursions and motions of mastication.

All motions should be followed up to their limits and great care should be taken that the paths of the palatal cusps of the maxillary molars be watched as they are the more common causes of the grinding noises when they pass over the buccal or labial cusps of the mandibular teeth. When points are observed to be "riding high" they are ground down until there is balance of the occlusion or until the noises are stopped. Observations should be directed to large fillings surrounded by thin walls as they vibrate most often under pressure of mastication and produce sounds which are hard to trace. It has been a source of great satisfaction and relief to both myself and to those patients who were benefited by such a simple treatment.

I shall be pleased to hear from any of the members of the profession who may have occasion to try this method for the benefit of their child patients as to the results obtained.

Correspondence and interchange of ideas is invited as it is really the only means through which progress is made.

KEEPING GOLF OFF THE DENTIST'S MIND

By Allen Holman Suggett, D.D.S., San Francisco, Calif.

I MET a man the other day who did not play golf. "Why?" I asked. "First," he said, "that game prolongs the life of our most useless citizens. Second, it's supposed to be exercise, but the players ride to the links in an auto. Third, the game is called a recreation, a pleasure that does a man good, but the player comes home often to his lonesome wife with a grouch because he's off his game. And that grouch lasts till he goes out and gets another grouch."

Well, and what did he do for recreation.

"Oh," he answered, "I take pictures."

"You ride out with your camera?"

"Yes, with my camera and my wife, and we come back refreshed and happy, together, she and I, like a couple of artists who have been playing with beauty in the sun."

I thought over all that this friend had said and I commenced to ask my dentist friends the same questions about their golf. Most of them played and were very fond of the game. I found young dentists, not yet well started in a practice, still in debt for their college course and their equipment, not only playing Saturday afternoon and Sundays but some were taking off a half day Wednesday. Some of them played on municipal links but most of them had joined clubs that cost all the way from $500 to $3,000 besides dues and other expenses. I have been amazed at the cost in time and money.

The important thing to consider is, what did they get for all of this? All of them claim it is done for their health. And it is a fine thing to be out in the open air and sunshine. To walk over the beautiful links is good exercise, and should prepare you to come back to your office refreshed and eager to get at your work. But it does not seem to work that way. To my question, "Hello, where have you been?" I have often got such answers as "Just been playing golf and have to go back to that damn office and slavery."

One dentist who said something like this, felt that dentistry spoiled his game of golf, and he was all the more impatient with his profession because he had met a friend who had "just made a barrel of money" in speculation. He had made as much in that one deal as a dentist makes in a lifetime. "A dentist," he concluded, "is nothing but a high-class mechanic."

Golf has a way of knocking the player's profession about like a little white ball. It gets into the mind and stays there all the time. I've heard dentists at lunch spend the whole time discussing how best to hold a club, which way to look and grieving that they were "off their game"; not off their professional skill, but—golf. I have heard the tale of the lonesome wife, too, but I will not go into that.

I think it is a mistake for a dentist who expects to practice his profession all his life to allow anything to interfere with his happiness in his work. He has chosen dentistry as his profession. He has prepared himself by years of study to practice it. If he finds he does not like it, the sooner he gets out of it the better. But if this is to be his life work, he should put all the interest into it and get all the pleasure out of it that is possible. He can do this by first arranging the most attractive office he can afford—an office so attractive that he loves to go there and stay there. He should manage his practice so as to cut out as far as possible all disagreeable features, do the kind of dentistry he likes to do, stress the art and the science and the service of it—for fun, for concentrated enthusiasm. Without enthusiasm a worker is dead. Without enthusiasm he can't serve and he can't fire others. Among the orthodontists there are a half dozen or more whose enthusiasm for the art and the growing science of their work is like a passion. To visit their offices and talk with them is inspiring. Everything they do, their vacations, their recreations, the papers they write, the clinics they give, seem to increase their interest in the growing art of their work. They get a joy out of their work. They are a contrast to the man who has to go back to "damn office" to earn a living. He goes to his office because he must. They go to their game as he goes—to the links.

One day in New York, at a time when there were a lot of railroad accidents, a fine old banker was asked what the matter was. "Have the railroads no trained expert, specialist railroad operators?"

"Yes," he answered sadly. "We have them, we make them, but as soon as they are made perfect, we promote them. They become vice-presidents at high salaries, they come to the cities where they meet other men with salaries and other interests—golf and stockdeal, and—railroad accidents."

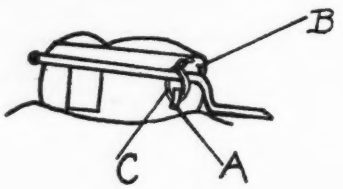
My experienced belief is that, while a man in any profession needs and

should have recreation, he should never let any sport or pleasure take first place in his mind. His chief interest belongs to his own game, his chosen profession. And as for my profession and yours, ours—dentistry is one of the youngest, most progressive, most "learning" of all the arts and crafts. Taken at its best possible, it is a better game, a pleasanter recreation, a finer art than golf or any other absorbing interest that now seems to be and in my opinion is a menace to it.

A LINGUAL LOCK

By L. Bodine Higley, B.A., D.D.S., Iowa City, Iowa

BECAUSE of the simplicity of this lingual lock, as illustrated in the drawing, I have refrained from presenting it to the profession. My action now is prompted by the fact that recently several practicing orthodontists have seen it and agreed upon the following advantages:



1. Its stability causes less frequent displacement.

2. It causes less gingival irritation on short or partially erupted teeth than, for example, the spring lock.

3. Its construction is of the simplest design.

4. Its mesiogingival position, together with the distal placement of the verticle, half-round sheath, gives a long mesiodistal attachment when the expansion arch is ligated to place, thus preventing rotation of the anchor tooth.

5. It is not attached to the arch wire, and so presents no interference when the arch is being placed in its sheath.

The lock consists simply of a small ring of material cut from a length of heavy-walled tubing, *A* in the drawing. This is soldered to the lingual surface of the anchor band mesially and near the gingival, with the opening parallel to the long axis of the tooth. After placing the lingual arch in its sheaths a brass ligature wire, gauge 24 or 26, is passed through the ring and around the arch wire and tightened, *C* in the drawing.

In case a half *U*-bend is made in the lingual arch which, of necessity, starts directly above the ring, a small lug, *B* in the drawing, may be soldered to the arch wire to prevent the ligature from slipping over the shoulder. This is not needed in most cases as the half *U*-bend can be carried mesially far enough to prevent displacement of the ligature, or the ring may be soldered slightly distally to the position previously given.

Case Reports

TARDY ERUPTION DUE TO SUPERNUMERARY TEETH (CASE REPORT)*

By Raymond L. Webster, D.M.D., Providence, R. I.

IN PRESENTING this case report, I wish to bring out two points. First, the necessity of very complete radiograms when the patient is first seen. Second, the importance of subsequent radiograms at intervals during the treatment of the younger children.

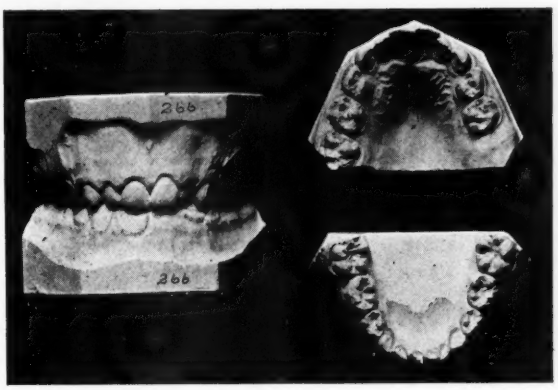


Fig. 1.

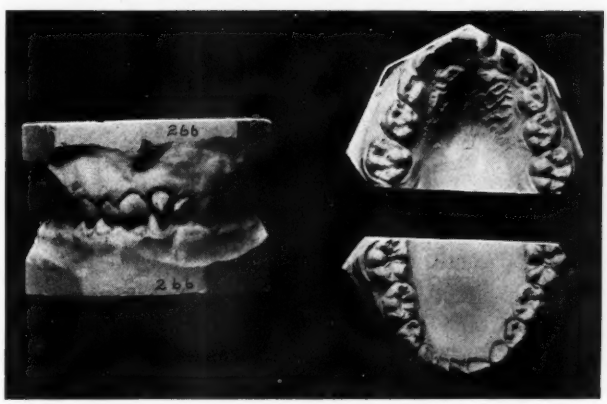


Fig. 2.

I was first consulted about this patient, a boy, aged six, due to a crowded condition of the right inferior permanent central incisor. (Fig. 1.) As this appeared to be a borderline case, models were made for observation. The history gave nothing unusual, the boy was in good health, and of small stature as were

*Given before the annual meeting of The New York Society of Orthodontists, New York City, March 14, 1928.

his parents. Radiograms were not taken as the office was not equipped to do so at the time; there was no suspicion of any abnormal conditions beyond what I could see. The child was then taken abroad and was seen again upon his return, six months later. At this time supernumerary left premaxillary central incisor was in place of the deciduous left central. (Fig. 2.) Radiograms were taken (Fig. 3), which showed the supernumerary to have an exceptionally long root,

Fig. 3-*A*.

Fig. 3-*B*.

Fig. 3-*C*.

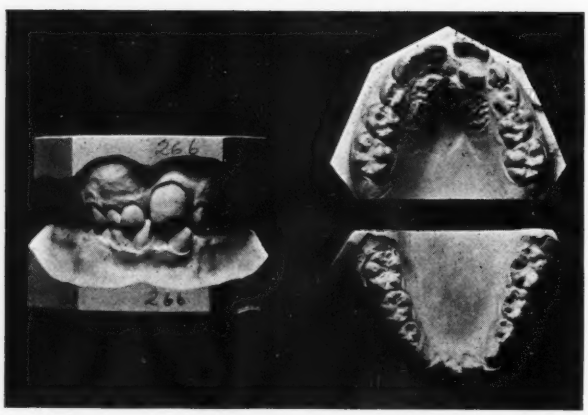


Fig. 4.

and the four permanent incisors present. Extraction of the supernumerary was advised, and lateral development of the mandibular deciduous arch was planned with the hope that it would influence development of the maxillary arch. This did not apparently appeal to the mother, for the case was not seen again until two years later.

An abnormally large left premaxillary central incisor this time prompted the mother to bring the child to me again (Figs. 4 and 5), and it seemed

as though I was only to act in the capacity of a consultant when something unusual appeared to the mother. The lateral, you will note, was in a palatal position and due to the size of these two teeth, I felt the arches to be of hardly sufficient width to accommodate them.

Radiograms were again made of the mouth, showing all permanent teeth present, but due to lack of clarity of the films showed no reason for tardy

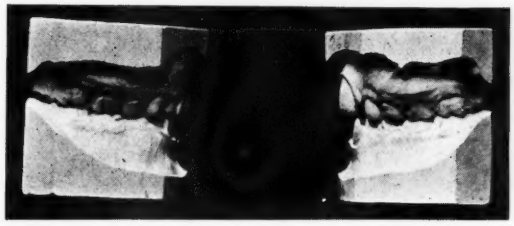


Fig. 5.

Fig. 6.

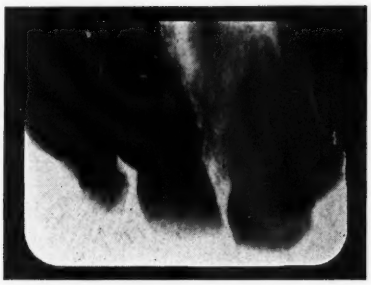


Fig 7.

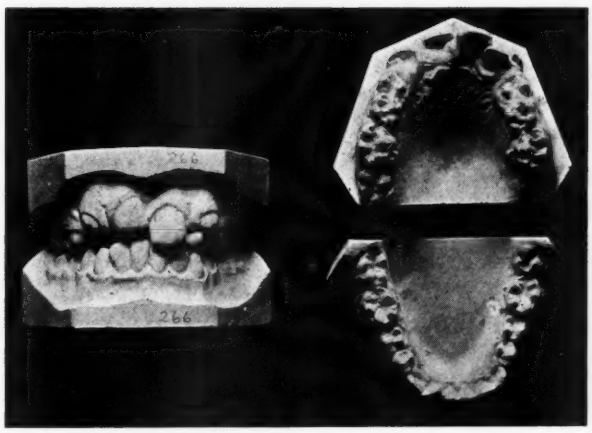


Fig. 8.

eruption of the right premaxillary central and lateral. Another check-up was taken of this area and showed the first semblance of what appeared to be a supernumerary tooth germ palatal to the unerupted right central. (Fig. 6.) This was called to the attention of the parent and the family dentist, but as the patient still had a very vivid recollection of the removal of that first supernumerary, the dentist preferred to defer any further operation for the present.

Appliances, however, were at this time placed on the maxillary and mandibular arches for their lateral development and for the distolabial movement of the left premaxillary lateral incisor, and it was not until a year later that the right premaxillary central incisor put in its appearance. After its eruption it seemed to come along no further during the next three months, and radiograms were

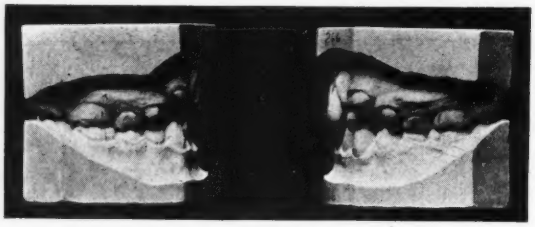


Fig. 9.

again taken. (Fig. 7.) This time they showed the supernumerary very clearly, considerably more developed, and it was quite evident that it was retarding the eruption of the right central. Its removal was therefore advised, and the tooth was extracted.

Since that time the central has come down much more rapidly (Figs. 8 and 9) and the case now appears to be progressing very satisfactorily.

CASE REPORT OF A CONDITION OF EXTREME DISTOCLUSION*

By Stephen A. Moore, D.D.S., London, Canada

IN PRESENTING this report to you, I do so with the knowledge that I have nothing new to offer. Any appliances or other means that I may have used to obtain the result were not original with me. The great change in the facial features shows what may be accomplished by tooth movement.

The patient in question was a young girl eight years, eight months of age. She was suffering from rickets and had previously measles, chicken-pox and mumps, the first two diseases twice. She suffered from recurrent colds but recently had her tonsils and adenoids removed and there appeared to be some improvement. At the time of her birth, her mother had been very ill which may account for the rachitic condition. The child was a bottle-fed baby, the pacifier had not been used but she had the habit of biting her lip and was a mouth-breather.

The parents' teeth showed no tendency to this type of malocclusion although the father and one brother have a condition of neutroclusion.

All her life the patient had been under the care of a physician and a great deal of the time had a nurse. She presented herself for consultation on September 21, 1922, and was in the condition shown in Figs. 1, 2, and 3. Models of her teeth are shown in Figs. 4 and 5.

*Read before the Annual Meeting of the Alumni Society of the Dewey School of Orthodontia, Hotel Vanderbilt, New York, August 29, 30, 31, 1927.

Fig. 1.

Fig. 2.

Fig. 3.

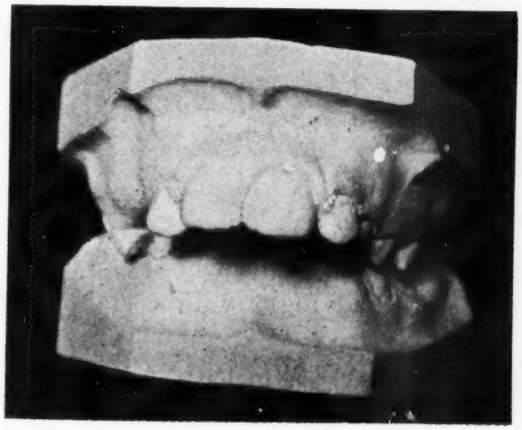


Fig. 4.

Fig. 5.

On October 7, 1922, appliances were placed in her mouth. The maxillary first permanent molars were banded and a soldered lingual alignment wire was attached to stabilize the molars and to be used later with wire stretching pliers. Buccal tubes were added and a high labial alignment wire with intermaxillary hooks and finger springs on the four incisors. In the mandible, the first permanent molars were banded, a soldered lingual alignment wire was attached resting against the incisors. Wire stretching pliers were used on

Fig. 6.

Fig. 7.

Fig. 8.

this alignment wire. Hooks were soldered on the buccal surfaces of the molar bands. Intermaxillary elastics were used day and night with certain rest periods as conditions indicated.

On February 13, 1924, the condition was as shown in Figs. 6, 7, and 8. At this time the mandibular appliance was changed. A labial alignment wire was placed in the child's mouth with finger springs resting near the incisal edge of the incisors and by means of ligatures the roots of the teeth were moved forward. Intermaxillary elastics were still being used.

On November 20, 1924, the mandibular appliance was again changed for a removable lingual alignment wire with finger springs.

On August 12, 1925, both appliances were removed and a Hawley vulcanite bite-plane inserted. This was lost in November of the same year and another one made. At this time all the child was wearing was the bite-plane. This was worn less and less until in March, 1926, its use was discontinued and the child had no appliance in her mouth. In May of the same year there appeared to be a slight relapse of the mandibular incisors, particularly the left

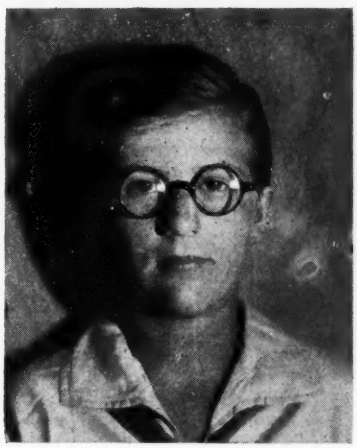


Fig. 9.

Fig. 10.

Fig. 11.

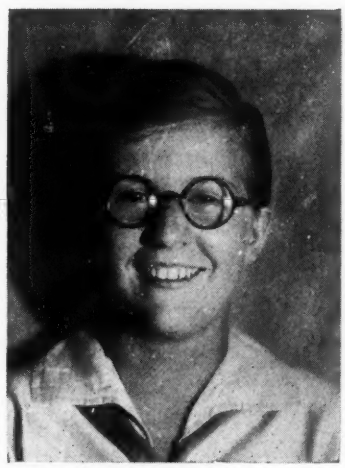


Fig. 12.

lateral incisor. A removable lingual alignment wire was placed in position with a recurved finger spring resting on this tooth. This was worn by the patient until the spring of this year. In April she came to my office with the appliance broken and stated that it had been broken for some time. The teeth seemed to be holding their proper relations so I left the appliance off and she has worn nothing since. Figs. 9, 10, 11, and 12 show how she appeared on July 28 of this year and Figs. 13, 14, and 15 show models of her teeth taken the same day. Figs. 16 and 17 are a comparison of the original condition with the final result.

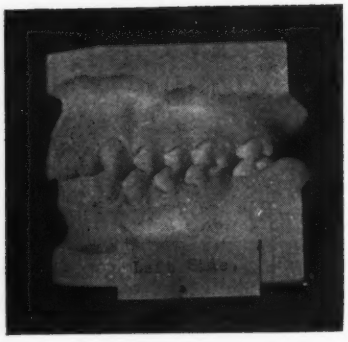


Fig. 13.

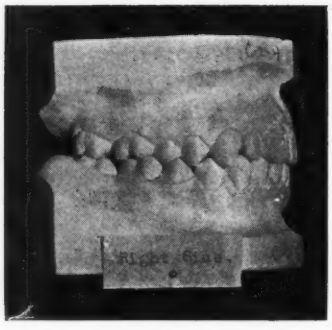


Fig. 14.

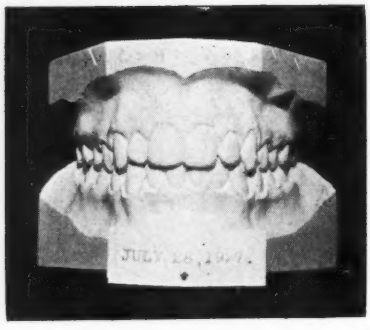


Fig. 15.

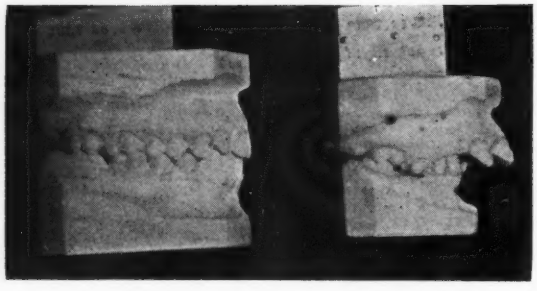


Fig. 16.

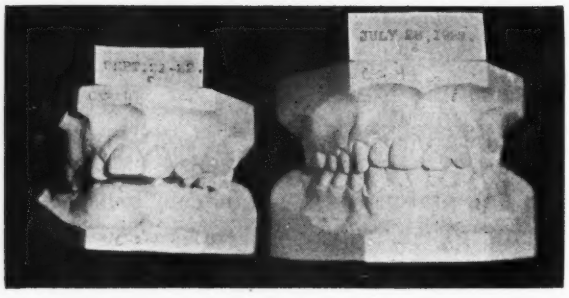


Fig. 17.

During the treatment of this case there were frequent rest periods of one month up to four months and for the last three years the patient has been using Dr. Roger's muscle exerciser. The diet was also watched very closely. I saw this patient last week and the relations of the teeth are as shown in Fig 12.

DISCUSSION

Dr. P. G. Spencer.—You have heard this report given by Dr. Moore and have seen the result which he has obtained. This report is now open for discussion.

Dr. C. C. Howard.—I would like to ask Dr. Moore if he has had other cases in his practice similar to this but with which he did not obtain such a beautiful result.

Dr. S. A. Moore.—Yes, I have had cases in my practice which have not reacted to treatment like the case shown.

Dr. C. C. Howard.—The point that I want to bring out is that it appears to be impossible to get results with a certain class of patients. Why this is I do not know. There also appears to be certain periods of growth, at which time the reaction to treatment is much better.

Dr. S. A. Moore (*closing*).—I thought Dr. Howard might ask me something regarding the condition of the endocrine glands in this patient. As far as we could find out they are normal. The patient is very intelligent and the cooperation that I received was all that could be expected. This, I believe, has a great deal to do with the result that was obtained.

Clinics

MORE CONTROL OF THE UNSEEN FORCES IN APPLIANCES*

By Charles A. Spahn, D.D.S., Newark, N. J.

THE history of the orthodontic first molar anchor band and different attachments thereto need not be rehearsed at this time nor its origin considered. We should believe that credit is due those who have contributed to all its modifications, which brings us to the band in general use by the orthodontists of today. This band can be acceptably made in many different ways, also the attachments or locks can be soldered to this band in various ways. It is this last item of anchorage technic that we will consider in detail.

During the time when we used only round buccal tubes on molar bands, it was acknowledged good practice to have that tube placed, if possible, on the buccal side at right angles to its axis, regardless of what torso position the molar occupied. The arch was then fitted or bent into many directions in order to place it passively into the tubes on both sides of the arch, inspecting each side separately, with one end of the arch in the tube and at the same time the other end out of the tube on the opposite side, but lying alongside this tube in order to determine its passivity in all directions. When this was accomplished, the teeth to be moved were then ligated to the arch, and when anchor teeth were to be moved the arch was straightened or bent in a direction favorable to the desired movement.

This entire procedure was not bad, because very gratifying results have been attained by many operators in this manner; however, we also recognized in many cases under treatment that the anchorage was being destroyed, injured, displaced, and presenting a condition of occlusal interference, all of which warned us to stop treatment and institute a rest period until such time as these teeth assumed more favorable relations. We did not undertake to move teeth bodily through the bony process, as we do now. The completion of the movements into their axile positions was supposed to be accomplished by mother nature. I have seen this take place in very few cases. Then came to us a series of different shaped tubes, locks, bracket bands, arches and instruments. With every change our problems were not made easier nor the results obtained any better until our respect for many collateral branches of the science was carefully interwoven into the application of treatment and then only when we became acquainted with the labial and lingual appliances, the construction of which is taught correctly by Doctors Mershon, LeRoy Johnson, Oliver, Eby, and others. These appliances have been modified by

*Clinic presented before the Twenty-sixth Annual Meeting of The American Society of Orthodontists, Chicago, May 2-5, 1927.

many men too numerous to mention. When correctly applied they are the only practical tooth-moving and bone-growing devices that I know of, for the orthodontist.

This statement should be accepted as a warning of danger rather than that of relief of the great responsibility of the past when we were using some of the more complicated mechanical devices. Our neglect of the minute details, seemingly not required, will waste for us and our little patients an untold amount of time, and create disappointment just as keen and greater than that felt at any time during our past experiences. Therefore, let us not neglect to do all that should be done at each sitting and if all the steps in our technic are correct, it will not be necessary to see our patients more often than once in five or six weeks or even longer provided the hygiene of the entire oral cavity can be assured.

We have now a definite reason and starting point from which we may increase the perfection of our technic and build these delicate and efficient appliances in such a way that their manipulation, while in the mouths of

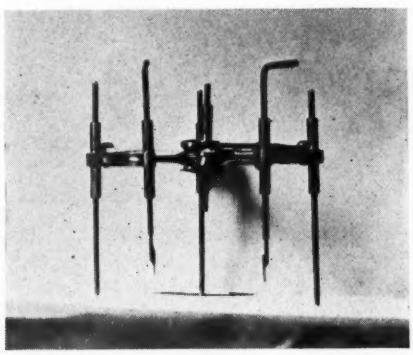


Fig. 1.

patients, will be more comprehensive and have less detrimental influence during the proper tooth movement and in this way control to a greater degree the unseen forces contained therein.

Dr. Delabarre of Boston distributed at the last meeting of the New York Society of Orthodontists a series of rules for the bending of wires which is very apropos of what I am endeavoring to bring to you.

The time has come when attachments or tubes both buccal and lingual should not be arbitrarily soldered in any position to anchor bands but should be soldered on the band which is on a model so that all attachments can be made harmonious in all directions whenever possible (Fig. 1).

For the placing of locks or attachments on the bands at the chair or without the use of a working model, this instrument is of no value, except that it would show you the necessity for care in this part of your technic in order to better control the base wire during the movement of the anchor teeth and the distribution of the auxiliary spring force in a more comprehensive way.

When one endeavors to change the position of the anchor teeth with the use of lingual wire attached to half-round tubes, we find in most instances

that the adjustment is made with pliers of different forms and it depends upon the judgment and experience of the operator to what degree he is successful in attaining the desired result. This operation because of the variation of the directions and curves in the base wire, we have found to be a very complicated procedure and one that should always be verified and checked up by an instrument capable of recording any change you desire to make. This apparatus should be one that represents very closely the conditions found in the mouth, as regards the attachment on the bands, and one sufficiently elastic to assume any position. The adjustometer designed by Doctor Leonard, of Baltimore, Maryland, seems to fill these requirements.

With the usual methods now employed in placing half-round tubes on anchor bands, the attachment as a rule is put in the center of the lingual inclined surface of the band in both upper and lower. In a great many instances the departure from the vertical plane of the position of the tube is greater because of the variation in the vertical axis of the anchor teeth. This lack of vertical harmony between two tubes combined with any other horizontal variation, is the cause for many of the aforementioned conditions in relation to anchorage disturbance (Fig. 2).

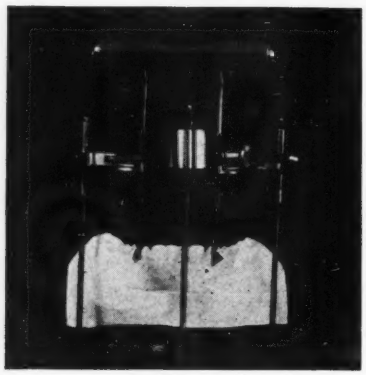


Fig. 2.

Presuming that the base wire is handled correctly in a case where the tubes are not parallel and we do not check in the adjustometer the movements made, we then have a directional resistance to cope with. For instance, it requires a great deal more time to intrude the anchor teeth than it does to extrude them and therefore we have all the variations of these two movements to contend with.

Again, if the position of the tube on one side is placed in a direction favorable to intrusion, that anchor will not move as much or as soon as the opposite one where we may desire no movement. This confusion is caused by the many planes in which the base wire was bent in its course around the alignment of the teeth at the gingival margin and lack of the proper position of the attachments to the anchor bands.

SUMMARY

1. If all attachments have been placed on anchor bands, parallel to one another in all directions, a more comprehensive and less dangerous adjustment of the base wire can be made without checking on recording instrument.

2. Experiments have proved the uncertainty of moving anchorage teeth with half-round tubes unless the change which you make in base wire is checked on a recording instrument before placing back in position.

3. From investigation it appears that the base wire should lie in as few different planes as consistent with the comfort of the patient and efficiency of the entire appliance for the required tooth movement.

FURTHER USES OF THE COIL SPRING AND RESULTS OBTAINED*

By E. B. Arnold, D.D.S., Houston, Texas

AT THE meeting of the First International Congress held at New York City in August, 1926, I presented a clinic entitled: "The Use of the Coil Spring in Orthodontia," which has been published in the proceedings of the First International Orthodontic Congress; therefore, I am not going to show

Fig. 1.

the same appliances, as they can be seen by referring to the above articles, but I am going to show some further uses of the coil spring in the movement of teeth. The coil springs are made of S. S. White 0.008 and 0.010 wire.

Figs. 1, 3, 4, 5, and 6 show cases at the beginning of treatment and ten to twelve months later, at which time they were put on a *rest period.* In these cases an expansion of from 3.5 mm. to 5.5 mm. was obtained by the use of the appliances shown in Figs. 2-*A* and 2-*B*.

Fig. 1-*A* shows a case where the space between the maxillary deciduous laterals was 3.5 mm. too small to accommodate the maxillary permanent centrals. Fig. 1-*B* shows the centrals erupted in the proper position after the expansion had been gained.

Figs. 3-*A* and 3-*B* show a similar condition in which a development of 5.5 mm. was gained.

*Clinic presented before the Twenty-sixth Annual Meeting of The American Society of Orthodontists, Chicago, May 2-5, 1927.

Fig. 4-*A* shows the crowded condition of the lower incisors and a slight irregularity of the maxillary centrals. Fig. 4-*B* shows the case after eight months of treatment. Note how both upper and lower incisors have aligned themselves into position without any part of the appliance touching them.

Figs. 5-*A* and 5-*B* show a condition with crowded maxillary and mandibular anterior teeth. Note how the teeth are aligning and rotating themselves, especially the maxillary laterals, as lateral expansion is gained.

Figs. 6-*A* and 6-*B* show a case in which it was necessary to solder an anterior finger spring on the mandibular appliance in order to move the mandibular left lateral forward, but this, of course, was not done until the expansion was gained.

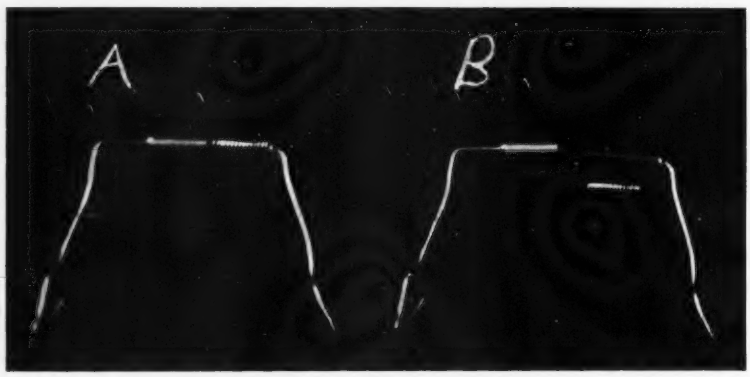


Fig. 2.

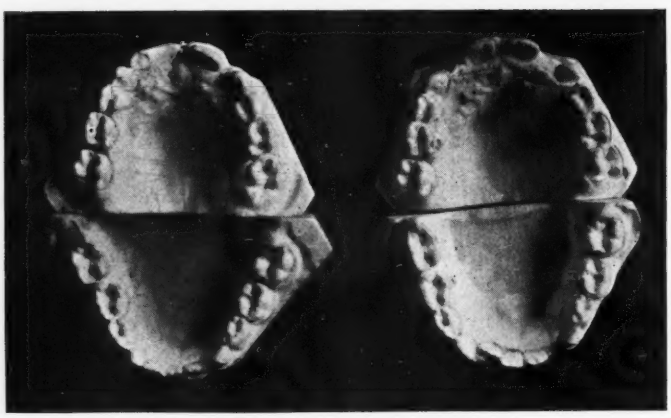


Fig. 3.

Figs. 7 and 8 show these cases occluded before and after expansion had been gained. Note that there has been no tipping of the teeth whatsoever and the occlusial function has not been impaired. To me, this is one of the most valuable features of the coil spring, as it seems to cause a lateral development without tipping the teeth. Of course, one must be careful of the amount of pressure applied. I have been using from 1 to 2 mm. of expansion in the coils.

Fig. 9 shows a case in which it was necessary to move a maxillary molar distally in order to make room for the second premolar. Figs. 10-*A* and 10-*B* show the appliance used in this case.

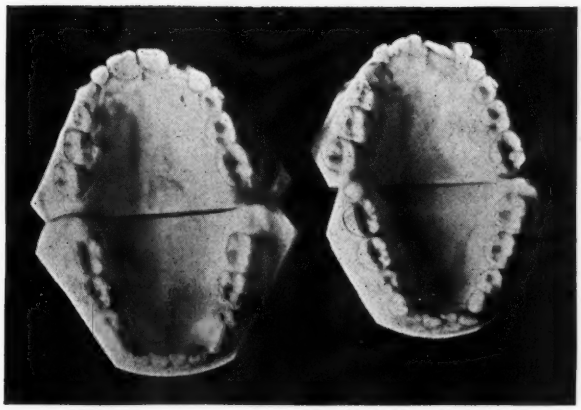


Fig. 4.

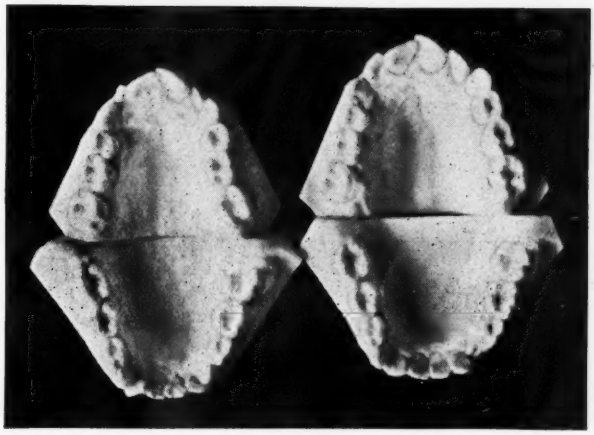


Fig. 5.

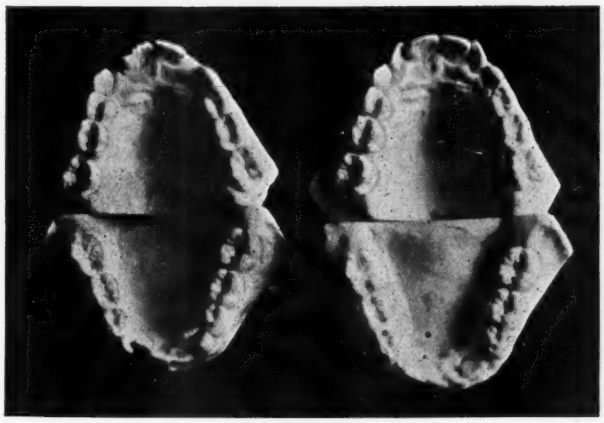


Fig. 6.

Figs. 11 and 12 show how well the appliance moved the molar distally, and very much to my surprise the second premolar has not only rotated, but has moved buccally, of its own accord without any mechanical pressure whatever, until it has completely jumped the bite and is now occluding edge to edge as shown in Fig. 12.

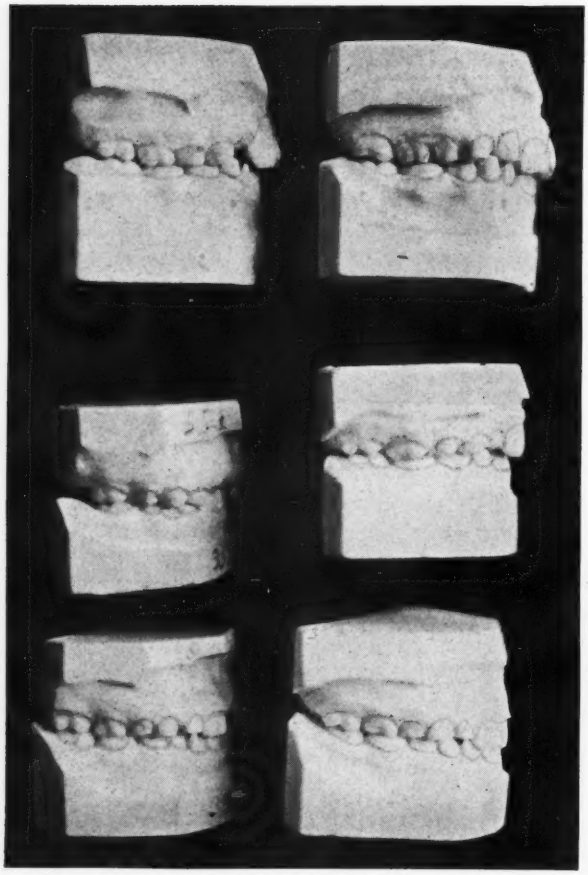


Fig. 7.

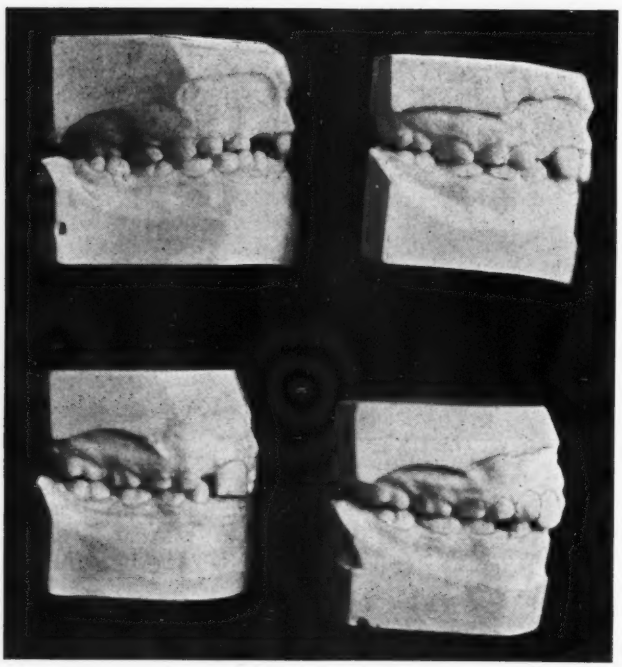


Fig. 8.

Figs. 13-*A* and 13-*B* show an appliance that I have been using to close anterior spaces. It is made in three pieces consisting of a piece of ribbon arch wire from canine to canine, and round wire from canines to molars. The fingers touching the laterals are soldered to 0.040 round tubes 3 mm. long, then

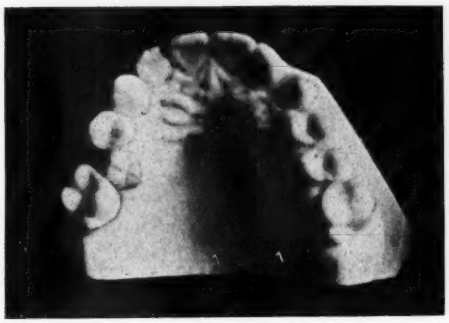


Fig. 9.

Fig. 10.

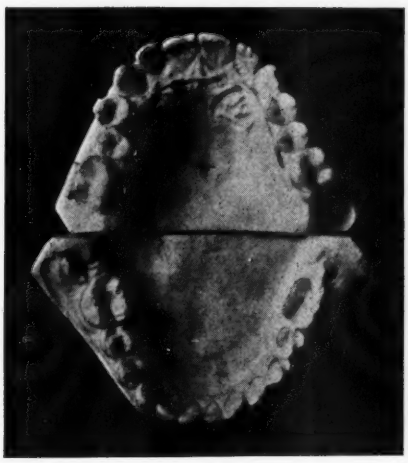


Fig. 11.

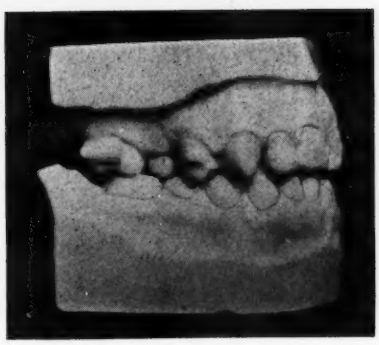


Fig. 12.

the mesial end of the tube is flattened on the wire about ½ mm., and not the whole length of the tube. This prevents the finger from dropping down and the flat wire acts as a trolley. At the distal of the spring there is a small 0.040 tube 1 mm. long which acts as a stop for the spring. This tube is not soldered to the arch, but there is a small amount of solder on the flat wire

which prevents the tube from slipping. When it is desired to apply more pressure, all that is necessary is to move the finger, coil spring and small tube well out of the way and apply a small amount of solder on the flat wire about 1.5 mm. from the original stop.

Fig. 13.

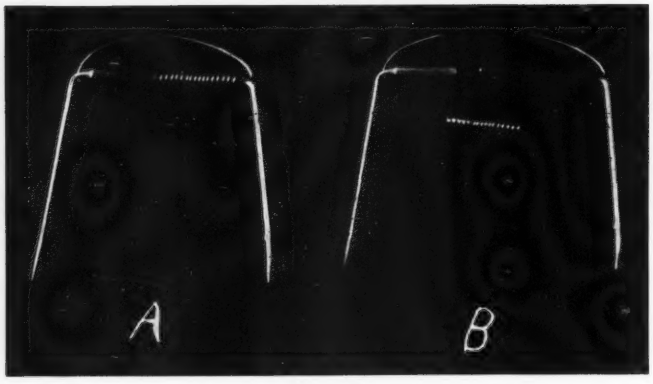


Fig. 14.

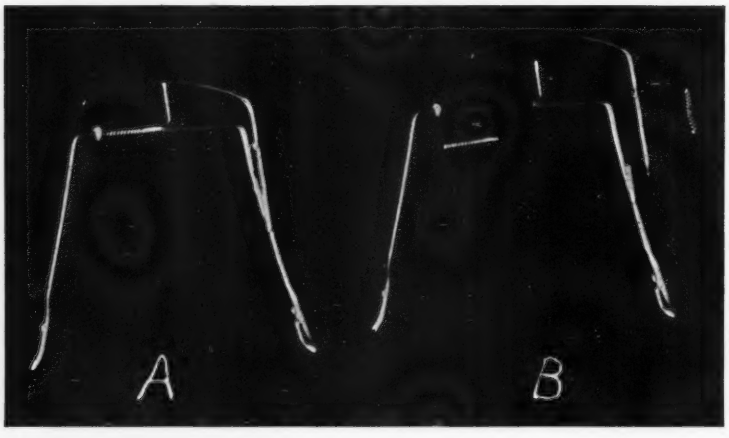


Fig. 15.

Figs. 14-*A* and 14-*B* show an appliance with which lateral expansion is obtained by the use of the coil spring and anterior expansion by the finger spring.

Figs. 15-*A* and 15-*B* show an appliance with which both lateral and anterior expansion can be gained by the use of the coil spring.

Figs. 16-*A* and 16-*B* show an appliance which can be used in cases where only anterior expansion is desired.

Figs. 17-*A* and 17-*B* show an appliance which I have been using to tip anterior teeth. The arch wire is constructed of 0.040 wire and the auxiliary

Fig. 16.

Fig. 17.

wire is 0.016 which is wrapped four times around the arch on both sides as shown in Figs. 17-*A* and 17-*B*. The pressure is applied by adjusting the auxiliary wire as shown in Fig. 17-*B* and the appliance is then put in the mouth and the body wire is ligated to the anterior teeth at the gingival surface.

INDIVIDUAL POINTS IN APPLIANCE TECHNIC*

By Harry E. Kelsey, D.D.S., F.A.C.D., Baltimore, Md.

THE basic idea of this clinic is to present the appliances and technic preferred by the clinician, in the treatment of average cases.

It is the belief of the clinician that standardization of appliances and technic is all important, both for results and for the saving of time, and with this object in view, the various materials used in the construction of appliances have been reduced to the minimum, so as to avoid duplication.

With regard to buccal tubes, we all recognize that it is often necessary to have them of such shape that they will provide a stationary and nonrotating attachment for our labial arches. For this reason I have adopted a tube, which is square inside and outside, and which will, when used with an arch

*Clinic presented before the Twenty-sixth Annual Meeting of The American Society of Orthodontists, Chicago, May 2-5, 1927.

with square ends to fit it, prove a satisfactory nonrotating attachment, but with a round end arch which fits it, rotation in the tube and tipping of the anchor-tooth, is just as free as it would be in a round tube. Therefore, I use but this one buccal tube, which is adapted to both square, rotating, and nonrotating arches and the buccal tube question is answered once and for all, without keeping in stock several kinds and sizes.

I prefer the square arch or at least an arch with square ends, because the small nuts which loosen and creep on round arches unless they have some special device to prevent it, do not do so on a square arch, and should they become slightly loosened with wear, a very slight compression on the flat side will make them firm again, the corners of the arch being wider and the only portion which receives the thread. This square tubing is also adapted to the attachment of many other forms of appliances.

One illustrated in the clinic consists of a short piece of square wire with spring of any desired gauge attached to its anterior end and passing distally to engage against a tooth distal to the anchorage for the purpose of pressing it lingually as in the case of a second molar which has erupted in buccal occlusion. The square wire inserted in the square tube prevents rotation, and the recurved spring can give all the tension desired. To accomplish the same thing with a round tube would require extra attachments. As all tubes are square, it is perfectly convenient at any time to have an attachment that will tip the teeth on one side and remain stationary on the other, simply by having a square end on one side of the arch and a round one on the other.

With regard to the arches, the square ends, as before stated, may be used with any desired gauges in the middle section, but if it is desired to thread the entire arch, none will carry the nut around the curved portions half so well as the square arch. My square arches are 0.036, straight through from flat surface to flat surface, and 0.042 or 17 gauge, diagonally. A 0.036 round arch end will fit snugly and yet rotate in the tube. The lingual tube and attachment here presented have also been adopted after the trial of many other forms.

None of the half-round tubes I have ever used will remain so firm and tight as this plain rectangular tube. The knife edge of the half-round wire is a weak point, both in the tube and in the post and I notice some of the manufacturers are eliminating it as far as possible. Possibly my own complaints may have had something to do with that. However, rectangular post 0.024 × 0.048 is much more stable, providing as it does a firm and broad mesial and distal surface against the inner wall of the tube, without necessitating a tube appreciably greater in thickness than the half-round one, and there is no more irritation to the tongue. These tubes as a standard size are 10 mm. in length and both they and the post material should be made of strong hard platinus-gold material. The lock for this attachment seems to me infinitely more compatible with the surrounding anatomic features than any other. It consists of a small lug, made from a short section of square or ribbon arch wire projecting forward about 4 mm. in front of the occlusal end of the lingual tube. This creates a little shelf and a lock wire made of a special alloy, which con-

sists of 14 karat gold alloyed with pure silver attached to the arch about 15 mm. anterior to the post, is pressed under the lug, which effectually prevents the post from being lifted out of the tube. This lock is 0.032 gauge and is soft and pliable, so that the arch may be removed and replaced a dozen times before it becomes necessary to replace it with a new one, which, however, can be done in a moment when it is necessary. Furthermore, the lock wire does not have to be pressed down under the tube and into the gum tissues as in other forms but engages in a position where it does not interfere with the gum. The lingual tube should in all cases be placed at an angle inclining forward at least 20 degrees from the perpendicular. This makes it easier to secure attachment and relieves the strain on the lock.

Dr. Angle pointed out many years ago that, if the vertical tube were inclined forward sufficiently and the anterior portion of the arch attached to the teeth, it would not come out even without any lock, but as the anterior portion is not always attached, it is important to always use the lock. In all but special cases, a square buccal and rectangular lingual tube are put on all anchor bands and the case is thus equipped with a stable anchorage and a secure attachment for any form of appliance that may be desired.

The filigree bite plane, still an important and much-used appliance in my hands, may be attached by means of maxillary lingual or buccal tube, according to the indication of the individual case. If it is desired to use the intermaxillary elastics at the same time that the bite plane is operating, it may be attached to the labial arch by means of wires, passing out just distal to the canine teeth and adjusting the ends of the arch so that they will slide freely back in the buccal tubes. Thus as the bite opens the maxillary teeth may be drawn distally. Occasional alteration in the form of the plane and the arch of course facilitates movement.

The filigree or open work bite plane was first demonstrated by Dr. J. Lowe Young, and I have adopted it in all cases where I use a fixed bite plane because it is the only one which will not eventually cause irritation of the palatal gum tissues. In conjunction with it I always use an auxiliary labial wire, which controls the anterior forward thrust of the bite plane on the anterior teeth, unless I chance to desire such a movement, and where this is the case, such movement is secured very satisfactorily by leaving off the labial auxiliary wire and altering the position of the plane from time to time.

Removable bite planes, however, similar to the Hawley retaining plate are used in a great many cases, especially where no other immediate movement is required and when the patient is reliable there is nothing more satisfactory.

My standard gauges of wire for arches and springs are 0.036 *square* and 0.036, 0.030, 0.026, 0.023, 0.020 and 0.014 *round* and, of course, the regular and baby ribbon arch wires, to be used in conjunction with the bracket band.

One pair of models illustrate, with the appliance which was used in the mouth, the use of a compound finger spring in the lower denture to move the anterior segment of the arch forward. The general application and use of springs and small attachments have, however, become so universal that it would be superfluous to attempt to illustrate them all here.

WIRE BENDING*

By Frank A. Delabarre, A.B., D.D.S., M.D., Boston, Mass.

DEFINITIONS

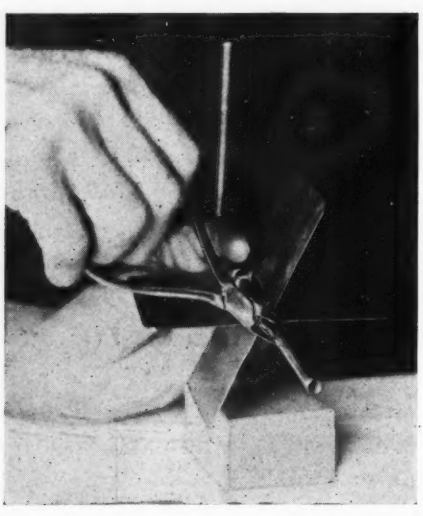
1. A straight wire lies in an infinite number of planes, all of which have a common axis in the wire.

2. Any straight wire lies in at least two planes.

3. Two straight wires that cross can lie in only one plane.

4. The horizontal plane is chosen from all these planes as the "Basic Plane" in wire bending. All other planes are to be visualized in their relation to the basic plane.

5. The bending point of a wire is that point at which it is desired to change the direction of the wire.



6. That part of the wire already adjusted up to the bending point is called the "Wire at Rest."

7. That part of the wire on the other side of the bending point is called the "Free End."

RULES

1. To bend the free end of a wire and deliver it in the same plane, the pliers should be held perpendicular to that plane.

2. To bend the free end of a wire into a plane of the third dimension, the pliers must be held perpendicular to that chosen plane, which plane must be that plane which also contains the wire at rest.

3. When adjusting an arch for expansion, the pliers should be held perpendicular to the basic plane.

4. When opening or closing a loop, the pliers should be held perpendicular to the plane of the loop.

*Clinic presented before the Twenty-sixth Annual Meeting of The American Society of Orthodontists, Chicago, May 2-5, 1927.

HIGH LABIAL ARCH TECHNIC AND SOME RESULTS*

By J. W. Ford, Chicago, Ill.

IN preparing this clinic I have constructed six High labial arches, as shown in Figs. 1, 2, 3, 4, 5, 6, 7, and 8. This shows the various types with finger springs as I have used them, but, of course, many additional types of finger springs are used by Dr. Lourie.

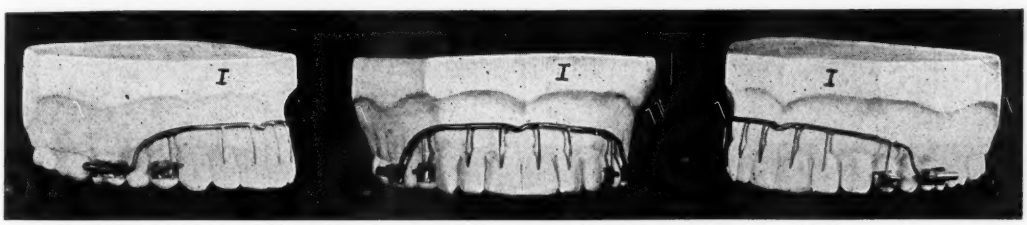


Fig. 1.—Type used in Class II, Division 1 cases. Intermaxillary hooks on first premolar finger springs, which are also being used at the same time for expansion.

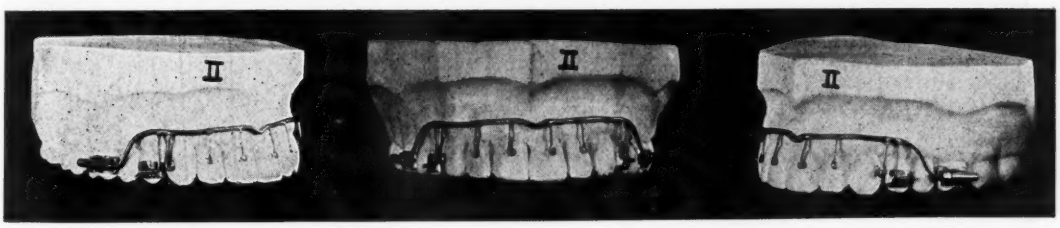


Fig. 2.—Type used in Class II, Division 2 cases. Separate intermaxillary hooks shown mesial to first premolar finger springs. Either type of intermaxillary hooks may be used. Expansion of canines and premolars is controlled by bending ends of spurs, as is shown in occlusal views of appliances I and II in Fig. 4.

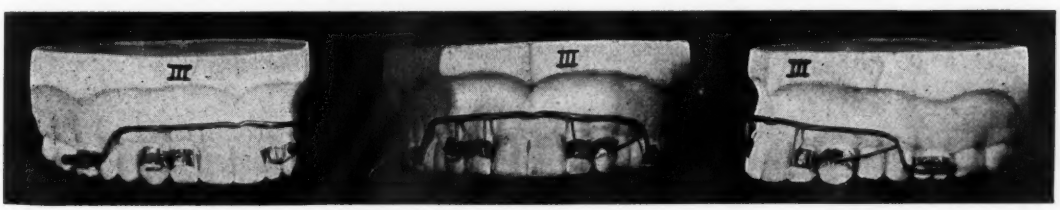


Fig. 3.—Shows type of finger springs to rotate laterals and canines. The right lateral is rotated by ligating from spur on lingual to L type finger spring on labial with eyelet. The left lateral is rotated by means of the J finger spring in tube. Both canines are rotated by means of finger springs in the horizontal tubes. Root movement is obtained on the right canine by means of the extra parallel horizontal finger spring toward the incisal. The finger spring, as shown on the left canine, is also very effective for root movement. In a practical case it would not be advisable to use the left lateral and right canine types of finger springs alongside one another.

The following points should be emphasized:

1. Use a 17-gauge gold platinum wire for the High labial arch base wire. This is important as a smaller base wire is liable to displacement from the

*Read before the First International Orthondontic Congress.

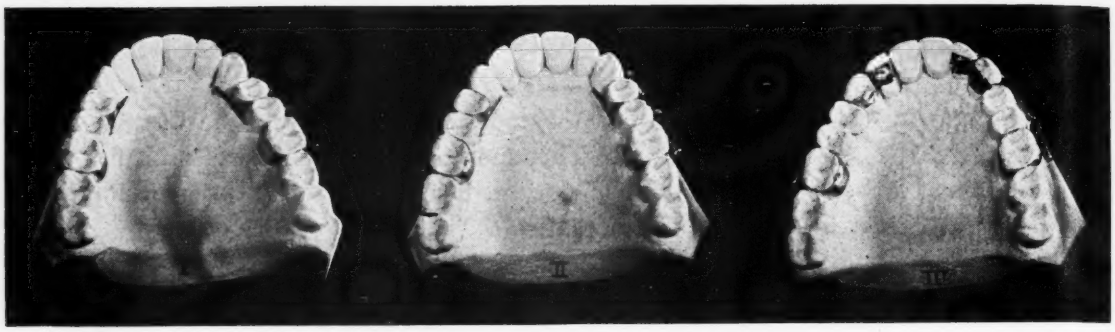


Fig. 4.—Occlusal views of appliances in Figs. 1, 2, and 3.

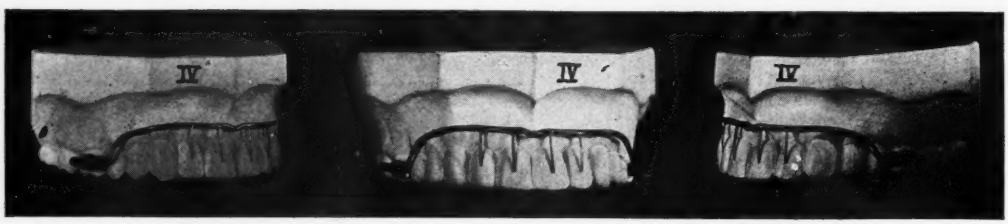


Fig. 5.—Showing method of tipping anterior teeth. The occlusal view of appliance IV in Fig. 8 shows the soldered lingual arch on first molars with fulcrum spurs at the gingival of the anterior teeth.

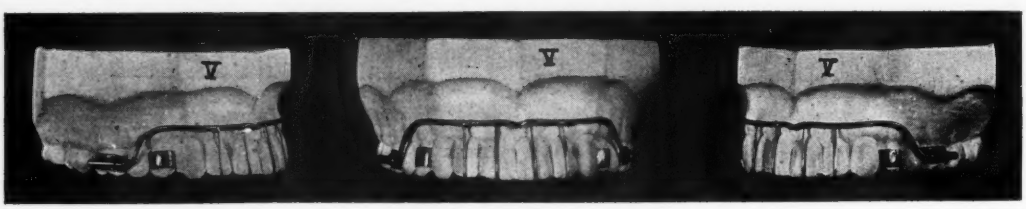


Fig. 6.—Type used to intrude anterior teeth, the ends of the finger springs hooking over the incisal edges. To avoid injury to the incisors or undesirable movement in anchor teeth this movement should be done very slowly. The occlusal view of appliance V, Fig. 8, shows anchorage reenforcement, the soldered lingual arch on the first molars passing above lingual hooks on the first premolar bands. This may be used to extrude the first premolars somewhat as the anteriors are intruded.

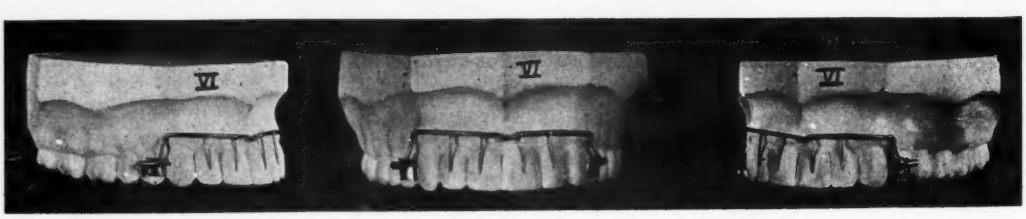


Fig. 7.—Type used where only movement in the anterior region is necessary. Various types of finger springs may also be used on this arch. The type as shown here may be used as a retainer. The occlusal view of appliance VI, Fig. 8, shows the lingual spurs which are to be bent to control expansion.

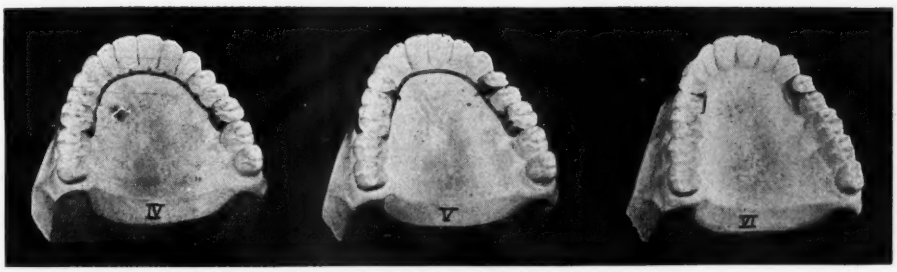
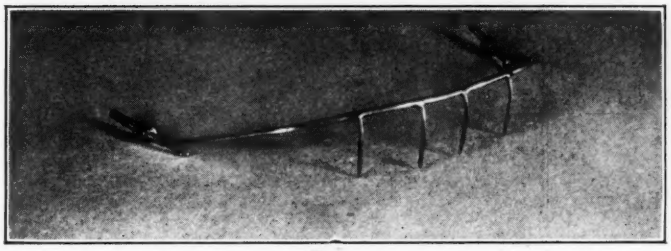


Fig. 8.—Occlusal views of appliances in Figs. 5, 6, and 7.

A.



B.

C.

Fig. 9.—Through the courtesy of Dr. Lourie is shown this appliance block of plaster. *A*, shows the arch with finger springs in place on the block; *B*, arch removed; *C*, block with arch removed.

This may be given to the patient during active treatment when allowed the privilege of removing the appliance for prophylactic purposes or during retention when the appliance is worn only at night. When not in use the patient places the appliance on the block and if it should not fit, he is aware that it has been distorted. If it should be impossible to visit the office, or the patient should happen to be from out of the city, the block and appliance may be sent in for refitting and returned.

action of the finger springs. When a short arch is used, as in Fig. 7, use a 19-gauge iridioplatinum wire.

2. Use 23- or 24-gauge high fusing clasp metal wire for the finger springs.

3. Stabilize the arch in most cases as is done on the first premolars in Figs. 1 and 2. If finger springs are securely ligated to teeth or attached to bands of course we have stabilization of the arch.

Fig. 10.—Shows case of unilateral distoclusion on left side, before and after treatment. In addition to the anchor bands for the high labial arch the right central and lateral and the left lateral were banded at different intervals, using the J finger springs. An ordinary alignment arch was used on the lower with intermaxillary elastics on left side.

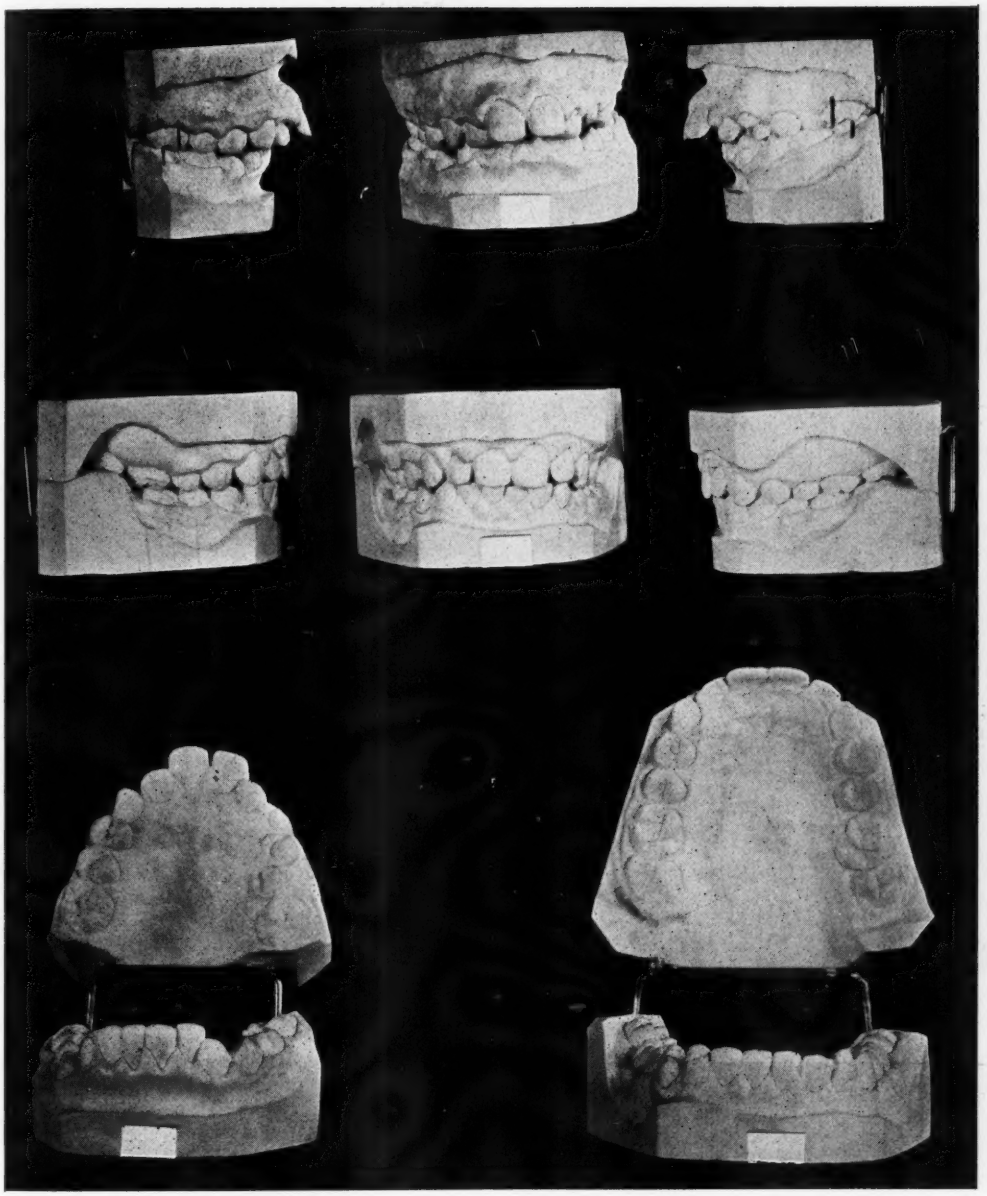


Fig. 11.—Case of bilateral distoclusion. In addition to the anchor bands the first premolars were banded to stabilize arch, as shown in Figs. 1 and 2. The laterals were banded later during treatment to be moved forward. Ordinary alignment arch used on lower with intermaxillary elastics. Occlusal view shows soldered lingual arch on first molars for retention.

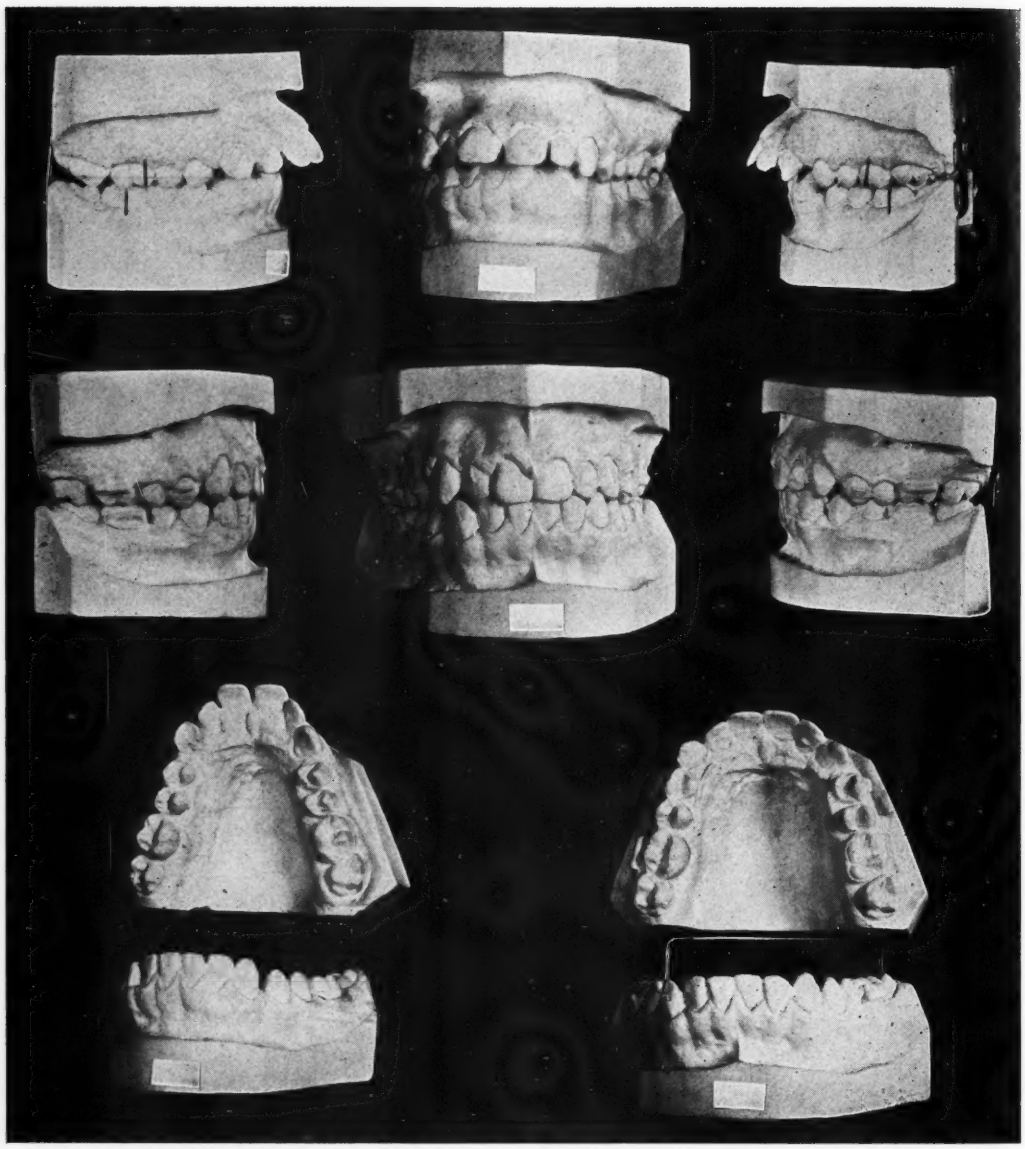


Fig. 12.—Approximately same report as for Fig. 11, except that in this case the laterals were banded for rotating and the appliance not changed for retention.

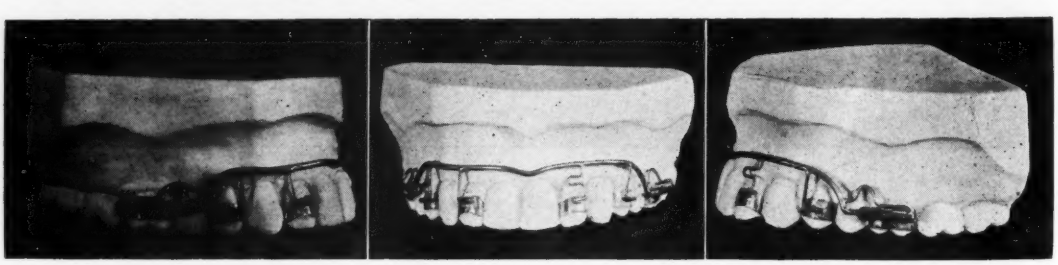


Fig. 13.—Shows application of McCoy open tubes to high labial arch both for finger spring attachments and locking arch in buccal tubes.

The finger springs as shown on the laterals should be 23 or 24 gauge high fusing clasp metal wire with the .030 wire soldered at right angles to the ends to be engaged in the open tubes. The loop as shown on the left lateral finger spring permits a greater range of application as for elongation, etc.

The loop locking .030 wires which are soldered onto the ascending portions of the high labial arch mesial to the molars, are engaged in open tubes soldered at about the middle of the gingival sides of the buccal tubes. The distal ends of the wires are bent at right angles to prevent anterior-posterior movement. The arch nuts are moved and the loops adjusted for any necessary anterior-posterior movements.

The same device is used on the first premolars as in Figs. 1 and 2 for stabilization and expansion of canines and premolars.

DEPARTMENT OF
ORAL SURGERY, ORAL PATHOLOGY AND SURGICAL ORTHODONTIA

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AGRANULOCYTIC ANGINA

Case Report

By Matthew White Perry, B.S., M.D., Washington, D. C.

Associate Clinical Professor of Medicine, Georgetown University School of Medicine

THE following case report is presented because it seems a typical example of an interesting and important disease which has been only recently recognized and concerning which comparatively little has been written.

Our case occurred in a woman who first came under our care for another condition in June of 1926. Accordingly we have the advantage of a complete survey made, over a year prior to the onset of the illness which constitutes our interest.

Miss F. P., aged forty-four, a government clerk by occupation, was referred to our office June 11, 1926, by Dr. John Warner. She gave a negative family history. She stated that she had had measles, mumps and scarlet fever in childhood, that she had had typhoid fever in early adult life and mild influenza during the epidemic in 1918 and that she had recently gone through a left facial paralysis diagnosed by Dr. J. Duerison Stout and Dr. Cardin Warner as a Bell's palsy. This attack had occurred two months prior to her visit to our office and had been treated with cure, recovery having occurred about four weeks prior to her visit to our office.

The patient came in for a general survey because of the occurrence of this Bell's palsy and *because of severe headache.* The headache, as described, involved the left occipital area and was unassociated with nausea or visual disturbances. She stated that she had been subject to headaches involving this area practically all of her life but that for a few months prior to the time of her visit to our office the headache had grown very severe and attacks more frequent in occurrence. She gave no history of digestive disturbances. She stated that she had a number of dead teeth some of which had been devitalized for a number of years.

Concerning her menstrual history she stated that her periods had always been profuse and especially so for about three years, lasting during this time about twelve days. When seen in June she had not menstruated for five months.

In going over the patient physically we found her overweight (weighing 179—normal weight 140) and evidently anemic. She had extensive dental work in the form of gold inlays, bridge work and crown work. Pelvic examination revealed a fibroid uterus. Examination of the nervous system revealed some weakness in the distribution of the left facial nerve but this impairment was slight. Routine physical examination was otherwise negative. Gastro-intestinal x-ray study revealed no organic disease. Laboratory studies showed an achylia gastrica and an anemia of the secondary type; hemoglobin 45 per cent—Dare; R.B.C. 3,500,000 and W.B.C. 7,500. The color index of the blood was 0.6. The red cells showed slight anisocytosis and poikilocytosis. The blood Wassermann test was negative. The blood pressure was 75-135. Routine examination of the urine and feces was negative. A second blood count done one month after the original study showed a hemoglobin of 45 per cent—Dare; R.B.C. 3,600,000 and W.B.C. 6,400. Dental radiographic studies revealed marked dental sepsis.

On the basis of this study a diagnosis of *fibroid uterus with menorrhagia and anemia secondary thereto,* with the presence of alveolar abscesses was made. It was felt that in all probability the Bell's palsy which had recently occurred might be related to the severe focal infection present and it was thought that the patient's anemia might account for the exacerbation in her headache.

Treatment at first consisted in an effort at building up the blood, and in clearing of the dental sepsis. The patient preferred returning to the dentist who had done her work and, as will be pointed out later, only a part of the septic condition was removed.

Hypodermics of iron and arsenic with a diet liberal in meats failed to produce any change in the blood picture. At the end of a month's treatment the blood count was unchanged.

At this time the patient began again to menstruate and a hemorrhage occurred from the uterus. In view of the patient's continued anemic state, it was thought best to allow no further hemorrhage of this type. Accordingly Dr. John Warner introduced radium into the uterus and from that time on no further uterine bleeding occurred. Following this procedure the blood improved, the hemoglobin going up to 60 per cent—Dare, by August of 1926. The patient's headaches were entirely relieved and she was discharged December 30, 1926, and advised at this time to have any remaining dental sepsis cleared. This, she was adverse to having done because of her freedom of all symptoms.

To summarize then the early record: The patient was a woman in middle life who had a fibroid with menorrhagia and an anemia of the secondary type and an achylia gastrica. She also had an extensive dental sepsis. Improvement followed hematinic treatment and the production of an artificial menopause by the use of radium, and dental extractions.

It would seem that the long standing menorrhagia might quite likely have damaged the bone marrow by overworking it in producing new blood. The occurrence of an achylia as seen in pernicious anemia is an interesting coincident. Blood counts, however, always showed an anemia of a secondary type and as will be later shown, at the time of the fatal illness the R.B.C. count was 4,310,000. This background, however, is of definite interest in connection with the bone marrow infection which later appeared.

The patient was seen no more until June 20, 1927, when she came in with a tender swollen left wrist and thumb joint with tenderness in the muscles of the forearm on manipulation. X-ray examination of the sinuses at this time revealed no evidence of disease. Another dental radiographic study was made and the following reported: "The left maxillary premolar area—suspicious pathology. The left mandibular third molar—test—nonvital. Recommend the extraction of the left mandibular pulpless third molar and exploration of the left maxillary premolar area." The patient was told that there might be a connection between this residual dental sepsis and her rheumatic manifestation and she was advised to have the necessary dental work completed. This was on July 14, 1927.

On July 16, 1927, before she had had any further dental surgery done the patient walked into the office at 5 p.m. very ill with a violent headache and with chilly sensations. Her temperature was found to be 103° and the pulse proportionately accelerated. Examination revealed no obvious cause for the illness. No abnormality of the throat or oral cavity was noted. No enlargement of the glands of the neck was discovered and physical examination was otherwise negative. A leucocyte count to our great surprise gave a report of 800 cells per cubic millimeter of blood. The patient was immediately placed in a nursing home. A leucocyte count done the following morning showed a count of 600 with a lymphocyte count of 100 per cent. Dr. Selinger who did this examination stated that a thorough study of the blood revealed no polymorphonuclear leucocytes. An examination of the throat on July 17, revealed an hemorrhagic infiltration involving the pharynx and the tonsils and peritonsillar regions. The appearance was that of a severe streptococcic infection. A blood culture taken on this date gave no growth. A leucocyte count made later in the same day showed a total count of 400 cells per cubic millimeter of blood with 100 per cent lymphocytes. A spinal puncture done on this day revealed no abnormality of the spinal fluid except a slight excess of globulin. Death occurred at 3:30 p.m., July 18, 1927, just two days from the time at which the patient walked into the office and it may be stated here, that she had worked at her desk in one of the government offices during the entire day of July 16.

The temperature range during the two days of her illness reached its maximum at 104.6°, declining on July 17, to 101.3° and returning to 103.6° just before death. The pulse during this severe febrile course varied between 100 and 108, a rather slow pulse in proportion to the temperature. Respirations were recorded as twenty-four per minute until just before death.

A partial autopsy was done by Dr. M. A. Selinger. Unfortunately an undertaker had injected embalming fluid before permission for autopsy was

obtained and no cultures could be made. The autopsy was essentially negative except for a markedly enlarged and swollen spleen which was stated to be two and one half times the normal size. The spleen was very soft and boggy. Microscopic sections showed more prominence of the malpighian bodies. Dr. Selinger stated that the splenic pulp did not present its usual cellular appearance and that the quantity of fibrous supporting framework was increased. Large amounts of iron pigment were scattered throughout the spleen. A number of degenerative areas were seen and in them micrococci ranged in chains. The other tissues were not remarkable except for cloudy swelling of the liver and kidneys. The bone marrow was not investigated.

To summarize the new phase of this patient's case, *the acute febrile illness which terminated her life,* we found ourselves dealing with the most violent and acute infection we had ever seen, *with a very remarkable blood picture,* with death in two days from the onset of symptoms, *the picture of profound sepsis,* with an acute fulminating throat infection appearing after the onset of the illness.

The first report of the disease of which our case seems to have been an example occurred in the German literature. Schultz, in 1922, reported the occurrence of a rapidly fatal septic disease characterized by gangrenous stomatitis and a marked leucopenia with total or almost complete absence of granulocytic cells in the blood stream. Following Schultz' report a number of similar cases were reported by German writers. In 1924, Lovett reported the first case in the American literature. Since that time quite a number of reports have appeared. Klastin in the June, 1927, number of the *American Journal of Medical Sciences,* reported two cases and reviewed the literature finding forty-one cases reported, and thoroughly discussed the subject. To this date only forty-three cases had been reported with the characteristic blood and clinical picture. Autopsies were reported on twenty-seven cases. On microscopic study the *bone marrow typically showed a cell poor structure with absence or great decrease in the granulocytic cells.* Lymphocytes, however, were prominent in the bone marrow. Cells making up the reticuloendothelial system were in general increased in number. No alteration in the red blood germinal centers was noted.

Quite a controversy has arisen as to whether or not this picture of a sepsis with tonsillitis and stomatitis and leucopenia, with absence of polymorphonuclear cells, with the above described bone marrow changes, constitutes a newly discovered disease or whether the picture may not be merely a profound sepsis of varying etiology. Certainly we have all seen cases of marked leucopenia in pneumonia and in various ordinary septic processes. Any overpowering infection may thus act. But to us this picture was a most unusual one. We had never seen so violent and rapidly fatal a sepsis *with a blood picture of this kind.* Every cell of bone marrow origin seemed to have been wiped out. Unfortunately we did not examine the bone marrow, but in all probability this case would have given the same bone marrow picture that other reported cases have given. The disease seemed a new entity, and in reviewing the literature it seems that the majority of observers have so felt. The marked similarity of the cases reported makes one feel that in all probability we are

dealing with a newly recognized and as yet, undetermined infection, an infection with a marked predilection for the bone marrow.

The one blood culture in this case was negative. The spleen showed streptococci in chains but with the marked stomatitis present these could easily have represented secondary invasion. Lovett, in her original report, cultured B. pyocyaneus from the blood stream and from the spleen and was able with cultures of this organism to produce profound sepsis, with leucopenia in guinea pigs. No cases of total destruction of the bone marrow white blood cells were thus experimentally produced, and nothing in Lovett's work is conclusive proof of the causative rôle of this organism. Nothing has been reported to indicate an epidemic character of the disease, and in cases reported, blood cultures in general have been negative and this very fact would argue against ordinary septic infections being the cause. This work of Lovett's seems to have been the only experimental work thus far reported throwing light on the subject and it must be taken as far from conclusive.

There has been, too, somewhat of a controversy in the literature as to the relationship of the angina to the disease. A number of cases have been reported in which the *angina appeared after profound sepsis and leucopenia had* been observed. Accordingly observers, especially the Italian observers, have regarded the tonsillitis and stomatitis as secondary manifestations of an infection which had gained entrance into the body elsewhere. In our own case little was evident about the oral cavity on the day at which the patient was first seen. A violent tonsillitis and peritonsillitis appeared later. It would seem quite possible to us, however, that the organism might gain the blood stream from the tonsillar tissues and being very virulent in its nature, produce systemic manifestations before local manifestations became marked. Certainly no other better portal of entry is suggested by those who hold the viewpoint that the tonsillitis and stomatitis are secondary manifestations. In many of the cases reported there has been associated ulceration about the genitalia, this appearing late in the course of the disease.

The disease has occurred mainly in middle-aged women and at first it was thought that it was a disease confined to this group of patients. A number of cases of late, have been reported in men. Dr. Kaufman's case was in a young adult male.

The differential diagnosis of this condition offers little difficulty. It is true that certain poisons such as benzol may entirely destroy the granulocytic cells in the bone marrow and consequently the circulating white blood cells of bone marrow origin, but there is not the febrile course or the ulcerative stomatitis, so characteristic in this disease. The aleucemic stage of leucemia may cause some confusion but the clinical course of leucemia is different and these cases of aleucemia eventually show the characteristics of ordinary leucemia.

If agranulocytic angina is a disease entity the greatest difficulty will come in differentiating it from cases of fulminating sepsis with neutrophilic leucopenia arising from ordinary causes. Blood cultures in these cases commonly show the causative organism and it is extremely unusual for all granu-

locytic cells to be wiped out. It would seem that all proved septic cases should be excluded from the group which we call agranulocytic angina.

To summarize then, we are reporting a case of a rapidly fulminating febrile disease, characterized by sudden onset, marked leucopenia with absence of cells of bone marrow origin in the circulating blood, with marked tonsillitis and hemorrhagic infiltration of the peritonsillar tissues, with death of the patient in two days,—the whole occurring in a woman who had previously had extensive dental sepsis and who had long been anemic from the menorrhagia of a fibroid uterus. This case, it seems, is typical of a newly described disease called agranulocytic angina.

We have here the spleen, and sections which may be compared with a section of a normal spleen. These sections show marked increase of the reticuloendothelial cells of the spleen.

Autopsy reports in general have emphasized this proliferation of the cells of the reticuloendothelial system. In fact the cells of this system seem to be the only defense mechanism capable of reacting against the infection.

PRACTICAL APPLICATION OF NITROUS OXIDE AND OXYGEN IN GENERAL ANESTHESIA*

By Dr. John W. Seybold, Denver, Colorado

TO INDUCE a state of surgical anesthesia without discomfort to the patient and maintain a condition which closely simulates natural sleep is an art and requires a thorough understanding of the following subjects:

1. The theory of how anesthesia is produced.
2. Signs and symptoms of anesthesia.
3. How to recognize patients contraindicated for general anesthesia.
4. Patients who are difficult to anesthetize.
5. Preparation of patient for anesthesia.
6. Practical application of anesthesia.

Just how nitrous oxide and oxygen produce anesthesia is a mooted question, but according to McKesson and Moots it must be due to the interference of the use of oxygen by the nerve cells, apparently exerting no other influence except the oxygen interference; furthermore its total effect upon the body continues but a few moments beyond the termination of its administration.

Guedel's hypothetical explanation of gas anesthesia appeals to me. He maintains that the interchange of oxygen and nitrous oxide between the alveolar space and the blood is more rapid than between the blood and nerve cell. In the lungs we have three processes, while between the blood and nerve

*Read before Arkansas State Dental Association, May 10, 1927.

cell we have one. For instance: In the lungs we have chemical combination with the hemoglobin plus simple diffusion and absorption; between the blood and nerve cell but simple absorption. This threefold action of the gases within the alveolar space is so rapid (displacing the oxygen in the blood stream) that the patient experiences a suffocating sensation, due to the fact that there has not been sufficient time for the nerve cell to absorb enough gas to produce unconsciousness. How to eliminate this suffocating action will be explained under Practical Application of Anesthetic.

SIGNS AND SYMPTOMS OF ANESTHESIA

The eyelid reflex, the eyeball movements, pupillary reflex, rate and rhythm of respiration, muscular condition and the color of the patient have a meaning all their own, and serve as signposts to guide us. These signs and symptoms

McKESSON'S N_2O-O SIGN CHART

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HT ANESTHESIA o too much oxygen in the mixture.	NORMAL ANESTHESIA Due to a properl- balanced mixture of N_2O-O.	PROFOUND ANESTHESIA Due to too much N_2O in the mixture or to partial obstruction of respiratory passages.
RESPIRATION (a) Superficial slow breathing usually regular. (b) Prolonged inspiration. (c) Phonation due to reflexes or pain. (d) Holding breath, grunting.	RESPIRATION (a) Full "machine like" respirations. Regular and faster than normal. (b) Inspiration and expiration nearly equal. (c) No phonation. (d) Continuous uninterrupted respiration.	RESPIRATION (a) Irregular rhythm (sobby) usually slower than normal. Spasmodic. (b) Prolonged expiration. (c) Phonation due to muscular spasm of vocal cords. Often crowing. (d) Cessation of respiration from spasm of muscles of exhalation.
MUSCULAR PHENOMENA (a) Movements or rigid muscles. (b) Facial expression of pain or consciousness. (c) Nausea, very rarely. (d) Reflex, or voluntary resistance.	MUSCULAR PHENOMENA (a) Immobile and relaxed, but having normal muscular tonus. (b) Expression of normal sleep. (c) Quiet. (d) Quiet. Relaxed.	MUSCULAR PHENOMENA (a) Clonic movements, twitching or jerking in early minutes of induction, often start in upper eyelids. (b) Expression wild looking. (c) Swallowing, retching or vomiting, common. (d) Tetanic, spasm, marked rigidity—opisthotonus in some cases.
THE EYE (a) Pupils large, contract to light actively. (b) Conjunctive sensitive. (c) Eyeballs roll. (d) Eyelids resist opening, winks when touched.	THE EYE (a) Pupils small or medium fixed. (b) Conjunctive insensitive to touch. (c) Eyeballs fixed or slowly roll. (d) Lids often slightly open, relaxed, no winking.	THE EYE (a) Pupils fixed, enlarge progressively and finally become irregular in shape. (b) Conjunctive insensitive. (c) Eyeballs fixed in some position or jerk. (d) Eyelids stiff. Often wide open.
COLOR IN SKIN (a) Pink or no change normally. (b) In anemics, no color change (c) In plethorics, slight cyanosis.	COLOR IN SKIN (a) Varies from sink to decided cyanotic tint. (b) In anemics, no color change. (c) In plethorics, considerable cyanosis.	COLOR IN SKIN (a) Usually cyanotic. (b) In anemics, slight flushing, rarely cyanosis. (c) In plethorics, almost black.
REMEDY Decrease the percentage of oxygen in the mixture.		REMEDY Increase oxygen in the mixture or in (d) inflate lungs with pure oxygen 1 to 3 times.

Fig. 1.—Anesthetic sign chart.

are best explained by chart, and as the simplest and most accurate one I have seen so far is McKesson's nitrous oxide and oxygen chart, that is the one I use in my illustrations.

HOW TO RECOGNIZE PATIENTS THAT ARE CONTRAINDICATED FOR GENERAL ANESTHESIA IN OFFICE PRACTICE

In my own practice, I make it a routine to observe the facies, palpate the radial pulses and verify with the stethoscope.

Beware of the following:

The well-developed, overgrown, robust appearance of the *young aortic regurgitant* with *pale lips* and *throbbing neck* and over-developed muscles.

In contrast, the *small undergrown, red* or *reddish-blue* patient with *congenital stenosis.*

Also the patient with a *pinched, patchy face* with *tortuous temporal arteries* and *wasted body,* typical of *cardiovascular degeneration.*

The *yellowish anxious face of infective endocarditis.*

The *large white face of renal disease.*

The *anxious expression* of the *face* we see in *angina.*

Pulse tension is influenced by the rate and power of ventricular contraction, the elasticity of the arterial walls, and degree of peripheral resistance to blood flow.

Beware of *irregularities* in the *force* of the successive pulse beats, *pulsus alternans.* This type of arrhythmia is of grave prognostic significance, pointing to the exhaustion of the myocardium.

In the normal subject there is no appreciable difference in the radial pulses. If they are not symmetrical, think of the following symptoms:

Aneurysm of the ascending aorta or innominate artery may retard the *right* radial pulse.

Aneurysm of the subclavian, brachial, or axillary artery may cause retardation upon either side of the body.

Pneumothorax or massive pleural effusion, by compression of the subclavian artery, may cause retardation or alter the character of one radial pulse.

Patients presenting any of these symptoms should be referred to a skilled internist for thorough diagnosis, but through their family physician.

RESISTANT TYPE OF PATIENT

This class includes those who are addicted to drugs, alcohols and heavy tobacco uses. We also find at certain age periods, according to Heidbrink and Guedel, that we will have a very narrow anesthesia margin and that it will be very difficult to maintain a quiet state of narcosis. This is due to the fact that at certain age periods there is a high metabolic rate which means greater oxygen demand for tissue respiration. Metabolic rate and reflex irritability run parallel courses, therefore these patients demand such a high percentage of oxygen to maintain tissue respiration that our nitrous oxide strength in the mixture is not sufficient to produce deep anesthesia unless we resort to the saturation technic of McKesson. These high metabolic periods are found between the ages of five and seven years, then again between twelve and fourteen years of age.

Morphine in proper dosage is a metabolic inhibitor, or if you prefer, the saturation technic can be used at these age periods. I prefer the latter method.

In regard to the drug and alcohol addicts, it has always been my practice to see that they get their regular dosage plus, so that they come to the table in what is a normal condition for this individual.

PREPARATION OF THE PATIENT

Harms of Omaha gave us the idea of alkalinizing our patients by means of orange juice. He says, and I concur with him, that it seems to promote a smooth anesthesia and reduces nausea in a class of patients that were formerly troublesome.

I now instruct my patients to take the juice of two oranges night and morning and to miss the last meal previous to the operation and take the orange juice only.

It is my practice to show all patients to the toilet previous to the administering of an anesthetic. It prevents accidents and embarrassment to all concerned. The patient is then shown to the rest room and requested to remove tight clothing. For instance, men remove coat, vest, collar and necktie. Women remove outer dress, girdles, corsets, neck bands and the like. They are provided with a surgical gown for their comfort.

I prefer and use operating tables in my surgeries as I believe that a better anesthesia can be produced upon a patient in a prone position than upon one in a sitting position. And I positively know, that if nausea occurs, that

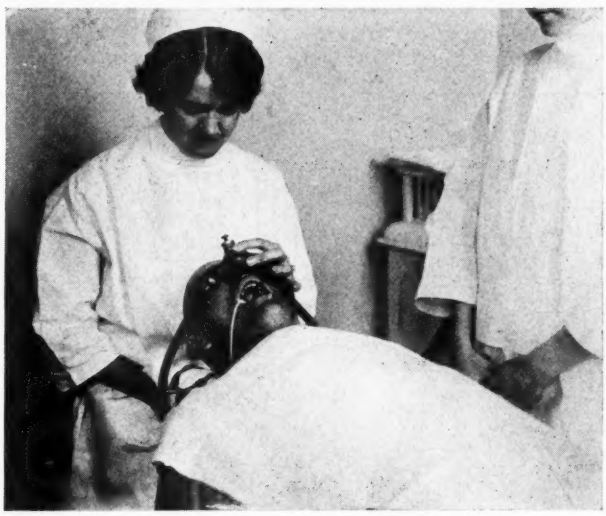

Fig. 2.—Starting anesthetic.

by simply turning the head to one side with the patient in the prone position, that it is very easy to take care of the vomitus, and yet not allow the patient to come out of the anesthetic.

To gain my patients' confidence and allay their fear, following the examination, I describe the sensations that they will experience as they go to sleep. Before bringing them into the operating room, I make sure that everything is in readiness, and that all the instruments are covered, as I wish to prevent mental shock. As the patient is placed on the table and while she is being draped, I say, "Mrs. Doe, this will be a pleasant experience, you will smell oranges, and then you will feel a pleasant glow pass all over you and then you will hear a little music as you go to sleep." This is literally true, for unknown to the patient I use oil of bitter orange peel. They feel the pleasant glow from the action of the anesthetic and as they feel this anesthesia coming on, a concealed phonograph is started by one of the nurses.

PRACTICAL APPLICATION OF ANESTHETIC

The finger of the anesthetist is wet with oil of bitter orange peel and just before placing the nose mask, the patient's nose is lightly touched with the

oiled finger. The nose mask is allowed to simply lie over the nose and the gases started to flow quietly, 5 per cent oxygen and 95 per cent nitrous oxide. The patient is encouraged to breathe normally, and after a minute or so, the oxygen is taken away and the flow of the gas increased. The nose mask is now securely fastened with the head straps, and head drapes placed over the hair, then mouth cover is applied. The eyelid reflex is now tested for resistance from time to time, and when the resistance is lost, the pupillary reflex and eyeball movements are the guides, together with the respiration. When the eyeball movements slow down or become fixed and the pupils do not react to light and respiration a little faster than normal and machine-like in regularity, it is time to introduce from 5 to 7 per cent of oxygen. The pupils and respiration are now closely observed from time to time. If the pupils are contracted smaller than normal, and the respiration machine-like, and expression of face normal or restful and the patient quiet, the mouth

Fig. 3.—Field of operation walled off.

cover can be removed and exhaling valve or nosepiece screwed down, almost shut. The flow of gases increased until the throat is packed and field of operation walled off. If the pupils are contracted and eyeball fixed and patient quiet and respirations full and regular, the operation can be started even though there is a slight tinge of duskiness to the skin. As the operation progresses and the patient does not resist, the oxygen is slightly increased until the color is normal. If this change causes the patient to resist, increase the flow or pressure of gases and gradually lower the oxygen percentage till resistance is overcome, but always watch pupils and respiration.

Should the pupils begin to dilate and respiration is depressed and the patient flaccid and relaxed, immediately give one or two breaths of pure oxygen, and if the pupils then return to normal, you will know that you are to give a higher percentage of oxygen and can probably run on less gas pressure. Always give as much oxygen as is needed for that individual patient, no matter what the percentage may be, for each patient is a law unto him-

self. When abnormal conditions arise and you are not sure of the condition, give oxygen until you find where your patient is as regards anesthetic depth. Remember that it is better to make mistakes by occasionally giving too much oxygen than too little; you can always deepen the anesthetic when you discover your mistake.

I always tell my nurses that a dilated pupil with a depressed respiration and flaccid musculature, means danger and on the other hand, the muscles may be spastic, hard and board-like, but both conditions indicate oxygen until symptoms start back to the normal, together with a normal respiration.

Should respiration cease and the pupils dilate, immediately remove the nose mask, set machine for pure oxygen, apply face mask and force pure

Fig. 4.—Aspirating vomitus.

oxygen into lungs intermittently, at same rate you would do artificial respiration. The exhaling valve on face mask should be closed so as to get positive pressure on the oxygen.

Should respiration cease, and the pupils become pinpoint or not dilated, and the color of skin show pink or brighter than normal, the patient is getting so much oxygen that he does not need to breathe. Cut down the oxygen percentage slightly, but do not change the flow or pressure of the gases.

Summing up, I would say, find your percentage of each gas, together with the proper flow or pressure for this individual patient, and wait until you have good anesthetic tension or surgical anesthesia before you start the operation; then refrain from making any more change than is absolutely necessary. Last but not least, watch the pupillary reflex, respiration and general muscular condition of your patient.

COOPERATION BETWEEN THE SURGEON AND THE DENTAL SURGEON*

By Lucius W. Johnson, Lieutenant Commander, Medical Corps, United States Navy

DURING the past 15 years, the subject of oral health has occupied so large a place in medical literature that its importance is now realized by the internist as well as by the dental surgeon. But the surgeon frequently fails

Fig. 1.—Microstoma following ulceration with loss of lips and columnella.

to avail himself of the special knowledge and skill possessed by his professional colleague in the treatment of diseases and injuries about the mouth.

In the Medical Corps of the Navy, we are fortunate in having closely associated with us the Dental Corps, composed of carefully selected men who keep in touch with the latest advances in the theory and practice of dental surgery, to cooperate with us in treating patients whose oral condition is important. The surgical service of a naval hospital receives many cases in which

*Reprinted by permission from the United States Naval Medical Bulletin, April, 1925, xxij, No. 4.

the surgeon and the dentist, working together as a team, can produce results greatly superior to those which either could accomplish alone. The latter has special knowledge of the anatomy and pathology of the oral cavity and is more competent in diagnosis of its surgical lesions, while the former has the special training which enables him to perform major surgical operations in the same field. Gillies says that the facial surgeon has the advantage of the orthopedist in that his instrument maker is a professional colleague who has for his goal the provision of the best masticatory result.

Fractures of the mandible make up a large part of the cases in which such team work is essential. Here the special skill of the dental surgeon is valuable

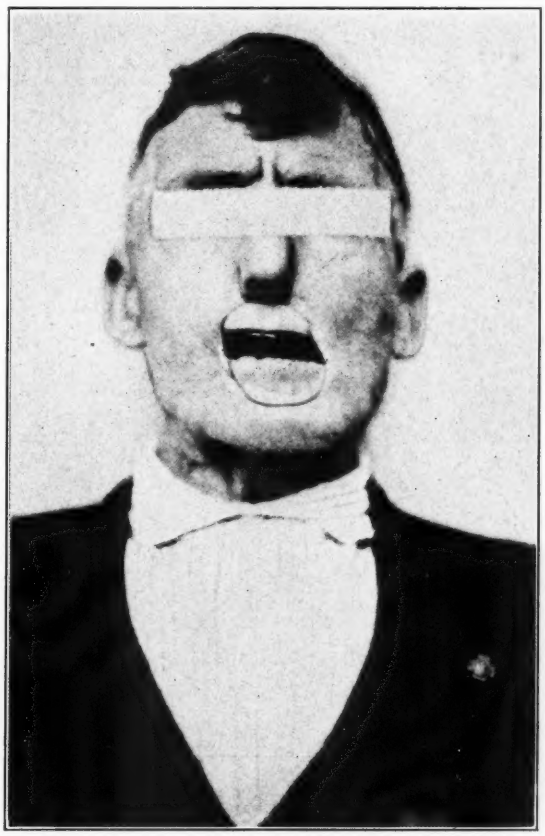

Fig. 2.—After first operation to enlarge mouth.

in diagnosis, in determining the amount of damage done, and providing fixation of the fragments. If extensive infection or faulty union follows and requires major surgery, then the surgeon is called upon to aid his colleague. There are few exceptions to the rule that simple fractures of the mandible are more successfully handled by the dental than by the medical profession; but when complications ensue, both must work together.

Chronic arthritic or myalgic conditions of obscure etiology lead us to suspect focal infection and here we are glad to lean heavily on the dental surgeon because the most common seat of such infection lies within his field. Leucoplakia, especially in the early stages before malignant change is evident, re-

quires the removal of all sources of irritation, whether mechanical or chemical, and for most of this we must seek dental cooperation. The writer has seen three such cases recently. Severe facial wounds involving the mouth require, during the period of primary healing, careful attention to mouth hygiene and the responsibility for this should be placed with the dental profession. When doing facial surgery, we frequetly need special appliances, splints or other devices which are best made by the skilled prosthodontist.

Several cases have appeared recently in the surgical service of the United States Naval Hospital, Washington, D. C., which illustrate the point and in

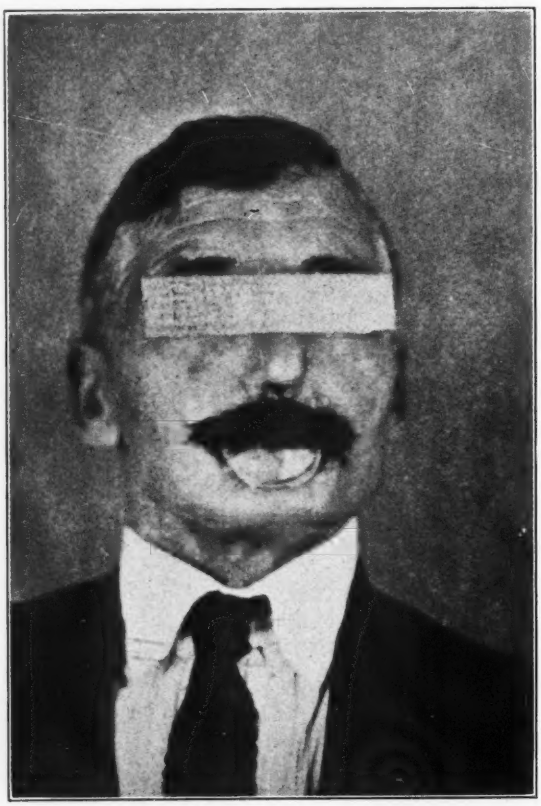

Fig. 3.—False mustache on upper plate.

which the able assistance of Lieutenant Commanders Darnall and Chandler of the Navy Dental School has been invaluable. The following cases will make this clear:

Case 724.—Luetic perforation of the hard palate. There is a hole 1 inch long and averaging one-quarter of an inch wide, through which the secretions of the nose continually pass into the mouth. During the stage of active treatment of the disease, this hole was closed by a plate made at the dental school. When the condition became quiescent, repair was made by swinging a flap from the margin of the opening to provide mucous membrane lining of the nasal cavity and sliding a flap of adjacent mucous membrane as a lining for the oral side. The plate was used to maintain the necessary pressure during healing and the maintenance of postoperative cleanliness was left to the dental surgeon.

Case 753.—Loss of lips and columnella by a chronic ulcerative process. The plastic work in this case is still in the early stages, four operations having been done so far to provide the foundation for the more extensive repair which is to follow.

As the ulcers healed, the contraction of the scar greatly reduced the size of the stoma and allowed only one-fourth of an inch opening (Fig. 1). The

Fig. 4.—Fixation by wiring upper and lower teeth.

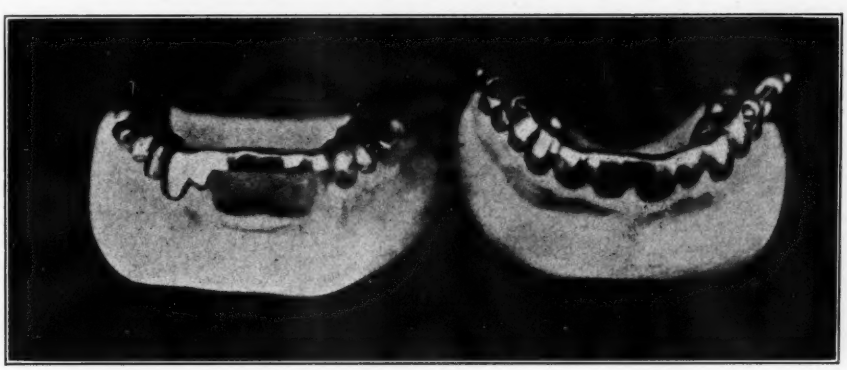

Fig. 5.—Models of jaws with position of mandibles corrected. Cast metal splints with locking device.

first operation was to enlarge the stoma by incisions three-quarters of an inch long on each side, skin being sewed to mucous membrane to maintain the opening. After healing, the patient was able to open his mouth wide enough so that impressions could be taken and plates made (Fig. 2). As some time will be required to form the upper and lower sulci on each side before new lips can be made, a false mustache was placed on the upper plate to make the disfigurement less apparent (Fig. 3). During the formation of the sulci for the lower

lip, the plate was used to hold the stent with the epithelial graft in place. After this was formed and grafted, an extension was added to the plate to fill and maintain the sulcus. There will be further prosthetic problems to be solved as the work in this case progresses.

Case 790.—Fracture of mandible near ramus, followed by prolonged suppuration and many sequestra, with union in poor position. Under ether anesthesia, an incision was made below the mandible and the fragments were exposed

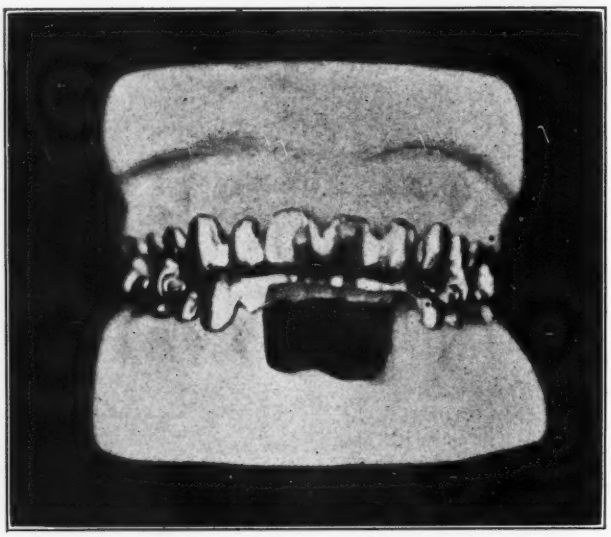

Fig. 6.—Cast metal splints with locking pins in place.

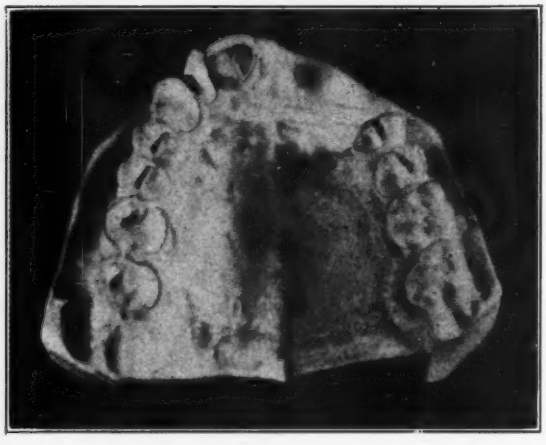

Fig. 7.—Model showing loss of teeth and opening in palate.

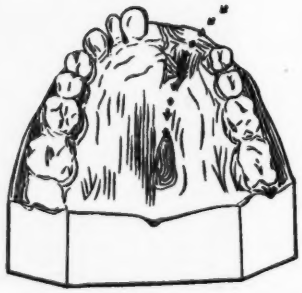

Fig. 8.—Diagram showing path of bullet.

and separated. The fracture was very oblique and it was possible to hold the fragments in good position with a single silver wire ligature after the surfaces were freshened (Fig. 4). Repair of fractures of the jaw by nonabsorbable foreign bodies is seldom desirable, but in this particular case it was the simplest efficient method. Following the operation, the upper and lower teeth were wired together for fixation. Later, a cast metal splint was made and applied.

Case 802.—Fracture of mandible at symphysis with union in faulty posi-

tion. A model was made by the dental surgeon, the position corrected, and a cast splint made (Figs. 5 and 6). Under novocaine nerve-block anesthesia, working within the mouth, the jaw was refractured, the position corrected, and the splint applied. Later, under general anesthesia, an incision was made below the chin, the fractured surfaces exposed and freshened, and an osteoperiosteal graft from the tibia applied.

Fig. 9.—Condition of tissues after primary healing.

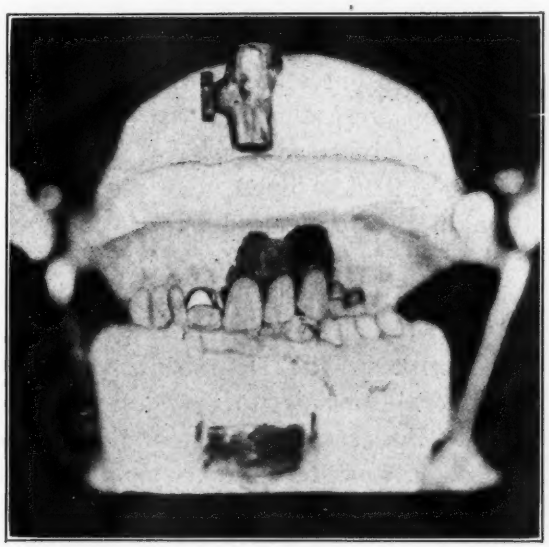

Fig. 10.—Plate to replace broken teeth and cover opening in palate.

Case 828.—Gunshot wound of face and mouth. The bullet from a 0.38 revolver entered the left side of the upper lip; passed through the alveolus, breaking off the left central and lateral incisors and canine and being deflected by them; passed through the hard and soft palates, producing a laceration which

extended nearly to the uvula; struck the posterior pharyngeal wall and fell loose in the mouth (Figs. 7 and 8).

The patient was placed in the hands of the dental officer until primary healing should be complete, which stage has now been reached (Fig. 9). An appliance was made which replaced the missing teeth and covered the opening in the palate so as to facilitate speech and swallowing (Fig. 10). An opening now remains at the junction of the hard and soft palate which will soon be repaired by a plastic operation.

CONCLUSION

There are many borderline cases in which the dental surgeon and surgeon, working together as a team, can produce better results than either one, working alone, could produce.

EARLY TREATMENT OF FACIAL INJURIES*

By Lucius W. Johnson, Lieutenant Commander, Medical Corps, United States Navy

ONE of the most admirable achievements of the medical department of the United States Army during the World War should be credited to Colonels Blair and Ivy and their associates of the maxillo-facial section. This was the indoctrination of the members of the Medical and Dental Corps with certain definite principles and methods of early treatment of facial wounds. The lessons learned by the earlier combatants at such terrible cost were available for our use when we entered the war and the principles based on this knowledge were taught to our officers, with the result that the extreme types of facial disfigurement were almost entirely prevented by proper conservative treatment immediately after injury.

The methods and the skill developed in this field of surgery have since found wide application in the prevention and correction of disfigurements due to the accidents of civil life.

An important principle developed in recent years is the necessity of continual cooperation of the surgeon and the dental surgeon. In the navy we have closely associated with us the Dental Corps, composed of carefully selected men, skilled in oral surgery, to cooperate with us in the care of maxillo-facial injuries and diseases. In many of these cases the general surgeon and the dental surgeon, working together as a team, can produce results greatly superior to those which either could accomplish alone.[1] The dentist has detailed knowledge of the anatomy and pathology of this region and is specially skilled in manipulations about the mouth, while the surgeon is versed in the general surgical principles which are essential to successful operation in any field.

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*Reprinted by permission from the United States Naval Medical Bulletin, July, 1926, xxiv, No. 3.

[1]Johnson, L. W., U. S. Naval Medical Bulletin, XXII; 4; April, 1925, p. 415.

There are now, in most of our cities, men who are skilled specialists in maxillo-facial surgery and able to handle alone any injuries in this region. But only a few of the facial injuries come immediately into the hands of these experts; most of them are first seen by the general practitioner or the dentist, and very frequently what the first man does may make or mar the ultimate result. Successful reconstruction must rest on a foundation of skillful primary treatment. Therefore, it is essential for all practitioners, whether dental or medical, to give careful consideration to the principles of early treatment.

Let us first consider the cases in which the soft tissues alone are involved.

Nowadays we see many patients with deep cuts caused by broken glass in automobile accidents and this injury may be taken as typical of a large proportion of those occurring in civil life. The lacerations may involve the parotid gland or duct, the masseter or temporal muscle, the larger blood vessels and branches of the facial nerve, all of which will require individual attention. Hemorrhage must usually be the first consideration and, while it is frequently profuse, it is seldom dangerous if there is anyone present with sufficient presence of mind to apply pressure to the bleeding points. One must always bear in mind the possibility of tetanus. The organism causing this disease has its normal habitat in the intestine of herbivorous animals, so manure, road dust, and garden earth must be considered as probably contaminated and, in nearly all cases, it is better to give the patient the benefit of the doubt and inject the prophylactic dose of antitetanic serum.

Next we must consider cleanliness of the wound. This means not only the removal of all foreign particles but also some means of sterilizing those which cannot be removed. Foreign bodies are virulent sources of infection and must not be allowed to remain. Various solutions may be used for sterilization of the wound—iodine, gentian violet, mercurochrome, or the chlorine preparations. Of the lot, tincture of iodine is probably most generally available and most reliable. Each of the other substances is more active against certain groups of bacteria than against others, or is unstable, but iodine gets them all, even the spores of the tetanus bacillus.

Then all parts of the wound should be carefully examined to see if there are any particles of tissue which have lost their blood supply, may become necrotic, and so favor bacterial growth. The very rich blood supply of the face favors us in reducing sepsis, first by keeping alive small shreds of tissue which might otherwise die and provide a haven for bacterial growth and, second, by bringing to the wound a generous amount of the body's own defensive agents. So, extensive debridement is rarely necessary about the face.

If there is no extensive soiling, it will be possible to close at once the sheath of the masseter, the temporal fascia, and other important deep structures, draining if necessary. Closing without drainage is safer with clean incised wounds than with those which show considerable bruising or tearing. If the sucking pad of fat, deep in the cheek, anterior to the masseter muscle, is exposed, a drain down to it should be left in for forty-eight hours.

The duct of the parotid gland is more often cut through than those of the other salivary glands. It is protected to some extent by the zygoma and its deep location, but one should always remember the possibility and look carefully for evidence of injury to it in wounds of the cheek. It is rarely possible to suture accurately the duct itself, so reliance must be placed on coapting sutures in the surrounding tissues. Accurate adjustment of the cut ends may be assisted by a very fine filiform bougie or lachrymal probe introduced from within the mouth past the point of injury, to hold the severed portions of the duct in their proper positions while suturing. The secretion of the gland will escape by the easiest way, and the object is to make the natural outlet the easiest and so avoid the formation of a salivary fistula. If there is considerable loss of tissue, including the distal part of the parotid duct, a suture may be passed around the end of the duct and this secured to the mucous membrane so that it will open within the mouth when healing has become complete.

Nerves to the muscles of expression are frequently cut. The middle branch of the facial, which supplies the *zygomatici* and the *levator labii superioris,* is more often cut than the nerve to the *depressor labii inferioris,* which runs most of its course beneath the mandible, or the nerve to the *frontalis* and *orbicularis palpebrarum,* which runs above the zygoma. If the patient can whistle, wrinkle his face, close his eyes tightly, and wrinkle his forehead, there is no serious nerve injury. Accurate suture of these very small nerves is rarely possible and so we must depend on coaptation sutures in the adjacent tissues to bring the cut ends as close together as possible. In this locality there is about 60 per cent chance of restoration of nerve function if the cut ends are within a quarter of an inch of each other and if there is no infection of the wound. Sepsis, and the fibrosis that result from it, cause very grave interference with nerve regeneration. If a nerve is cut, one should look for evidence of return of muscular control in eight to twelve weeks after closure of a clean wound. In this region there does not exist the same need of massage and electrical treatment of the paralyzed muscles that we have in similar lesions of the limbs, but I am convinced that massage is of distinct benefit in the healing process.

Shall the wound be closed at once or shall we wait and do delayed primary suture after we are sure it will be clean? This is a most important decision and one in which many considerations are involved. Delayed suture may mean more granulation and contraction, possibly distortion by gravity or muscular pull, while too early suture and inadequate drainage mean extension of infection, possibly necrosis, loss of valuable tissue, stitches torn out, and more scar tissue. The decision must be based on the character, location, and extent of the wound, the probability of infection, and the amount of tissue lost.

Incised or lacerated wounds of the ears, eyelids, or nose, and those traversing the vermilion border of the lips should usually be repaired immediately. Drainage should be used if there is sufficient loose areolar or fatty tissue in the neighborhood to make it probable that considerable swell-

ing will follow. Aseptic healing cannot be expected if the wounds penetrate into any of the mucous-membrane lined cavities; practically all of these wounds require, free, dependent drainage. When there is considerable loss of tissue in a wound which enters the mouth or nose, we should follow the principles laid down by Gillies and suture skin to mucous membrane all around the margins of the opening, leaving as little raw area as possible to undergo granulation. When the vermilion border is cut, we should be especially careful to get an accurate adjustment of the parts, for any irregularity of the border is very conspicuous.

Gunshot wounds of the face must always be considered as infected wounds. After all foreign bodies are removed and grains of powder picked out to prevent tattooing, the wound should be swabbed with iodine or other antiseptic and drained, or else left wide open while waiting for the sepsis to appear.

These wounds of the soft tissues alone are relatively simple to manage when compared to those which involve the bone. Here especially we need the assistance of the dental surgeon, whose most important duty is the control and fixation of bony fragments by prosthetic or other means.

All pieces of bone which retain periosteal attachment and can be retained in approximately their normal position should be saved. Small pieces of bone without blood supply, as well as roots and broken teeth, should be removed, because they favor the persistence of sepsis if they remain as loose foreign bodies in the tissues. Every effort is to be made to fix all retained fragments of bone as early as possible in their proper position, since this greatly favors early healing and reduces the amount of late repair work. Frequent roentgenograms are of the greatest value in diagnosis and as a control during the time of healing.

Fractures of the mandible may produce edema of the submaxillary region or, by relaxation of the muscles controlling the tongue, cause serious interference with the respiration. Replacement and retention of the fracture will usually relieve this. If there is loss of a portion of the mandible with the ends of the bone exposed, the ends should be covered as far as possible by sewing the soft tissues over them. The remaining fragments then should be fixed to the upper teeth, or in some other manner, so that the support to the base of the tongue will not be lost.

Fractures of the maxilla, especially those with considerable loss of its substance, will frequently tax to the utmost the prosthetic skill of the dental surgeon. Early replacement and fixation are essential because of the important rôle played by this bone in its support of those most useful and conspicuous features, the nose and upper lip. Fractures of the zygoma may sometimes be corrected by using a sharp hook thrust through the skin, but more often an open operation will be necessary.

All of the injuries which involve the maxillary bones will require complete toilet of the mouth with removal of all septic roots, broken teeth, or other conditions which may favor sepsis. The duty of producing and maintaining the proper cleanliness of the mouth belongs to the dentist and this is often a heavy responsibility. When there is injury of the bones it is

doubly important for one to restrain one's natural desire to close the disfiguring wounds at once, to stretch the soft tissues across the gaps, and to suture tightly. Such treatment tends to obstruct the blood supply, interfere with drainage, and produce the three dreaded sequels, secondary hemorrhage, edema, and sepsis.

Secondary hemorrhage practically always results from sepsis. Occasionally a hard foreign body in contact with the wall of a blood vessel may be a factor. It is not a frequent complication of the wounds of civil life. The treatment is to open the wound widely and secure the bleeding vessel. This is a simple matter if one is familiar with the blood supply of the part. Occasionally there is hemorrhage from a vessel within a bony canal, or otherwise inaccessible, which may require ligation of one of the large vessels in the neck, a procedure which is relatively safe in the young but may cause hemiplegia in the aged.

Edema results primarily from interference with the blood supply, especially the venous or lymphatic drainage, so that an excess of fluid collects in the tissues. There is distention and maceration of the tissues and the tension may increase so far as to tear out the sutures. The waste products of metabolic activity are not promptly removed, the oxygen supply is reduced, and the acid content is increased. Martin Fischer has shown that this increased acidity has a specific action in increasing the edema. The excess fluid collecting in the tissues may cause so much distention as to tear out the sutures. Wherry and Hogan, of the University of Cincinnati, demonstrated that bacteria grow better in edematous tissue than in normal tissue, where all the water is held in intimate combination by the proteins. Bacteria which will not grow at all in the normal tissues will grow with increasing energy in proportion to the added amount of water which collects in the tissues, and removal of the excess fluid results in their death without any other antiseptic action being required. This is one reason for the well-known efficacy of the astringent and dehydrating applications such as saturated solution of magnesium sulphate and Wright's hypertonic saline solution.

The edema should be treated by removing all sutures, opening the wound freely, and applying hypertonic salt solution as a wet dressing. A very rapid improvement will be observed after this is done, and the sooner it is done, the less will be the permanent damage to the tissues. Early massage and radiant heat or exposure to sunlight are also valuable aids.

Sepsis is rarely a dangerous complication when properly handled. If it occurs, remove the stitches, examine carefully once more for foreign bodies, such as metallic particles, dirt, or fragments of bone. Wright's hypertonic saline solution with sodium citrate is very useful as a wet dressing. The chlorine compounds, such as Dakin's hypochlorite solution and dichloramine, are poorly adapted for use in this region, and the dyes, such as mercurochrome, gentian violet, and flavine, are to be used with great caution because of the occasional occurrence of tattooing after their use. The surfaces may be cleaned by swabbing or spraying with hydrogen peroxide and the wet dressing of Wright's solution then applied. This solution consists of sodium chloride, 50 grams, and sodium citrate, 5 grams, to the liter of water. There

is a constant outflow of serum when this solution is used, which rapidly dehydrates the tissues and kills or removes the bacteria. Frequently the improvement is so rapid that secondary suture can be done after twenty-four to forty-eight hours of this treatment.

Erysipelas is a rather common complication, especially of wounds involving the nose. It is seldom serious and can usually be controlled by continuous application of a pad of about eight thicknesses of gauze kept constantly wet with saturated solution of magnesium sulphate.

Anesthesia may be unnecessary in repair of facial injuries in adults, especially if done soon after the wound is received. Children will usually require general anesthesia if accurate sewing is to be done. Local anesthesia will be the method of choice in many cases and for painful dressings in adults the ether cocktail, recommended by Gwathmey, will often be found satisfactory. This may be of varying strength, according to the individual and the length of analgesia required. Ether, 16 grams, liquid petrolatum, 16 grams, and peppermint water, 0.4 gram, is a weak one. Chloroform, 5 grams, ether, 20 grams, and liquid petrolatum, 20 grams, is much stronger. They are administered by mouth and there is usually a period of excitement lasting a few minutes, followed by a deep sleep and analgesia, during which the dressing or sewing may be done. Oil-ether colonic anesthesia is valuable for more extensive repair work.

When closing deep facial wounds it is essential not to neglect suture of the deeper layers with absorbable material. This obliterates dead spaces, prevents collection of extravasated blood in the tissues, and lessens the amount of fibrosis and contraction after healing.

Dressings should be as small as possible, not only for cosmetic reasons but also because the smaller dressing is more comfortable and makes inspection easier. It also produces less maceration of the tissues than the large dressing, which retains more of the heat and moisture. If the wound can be closed and accurately sutured, simply painting it with compound tincture of benzoin will often suffice. This forms an air-tight protective coating like a varnish. Raw surfaces or skin-grafted surfaces may be covered with vaseline gauze or netting impregnated with paraffin, both of which can be removed without tearing the fresh granulations.

Drains should be of some impervious material rather than gauze, the meshes of which soon become filled with coagulated serum, causing it to act as a plug instead of a drain. Rubber dam, rubber bands, or strands of suture material are very satisfactory drains.

In closing I wish to emphasize once more the value of cooperation between the dentist and the surgeon in the treatment of facial injuries.

DEPARTMENT OF
DENTAL AND ORAL RADIOGRAPHY

Edited By
Clarence O. Simpson, M.D., D.D.S., F.A.C.D.,
and Howard R. Raper, D.D.S., F.A.C.D.

RADIOGRAPHIC POSITIONS FOR STANDARD ROUTINE ORTHODONTIC EXAMINATIONS OF THE TEETH AND JAWS*

By L. M. Waugh, D.D.S., F.A.C.D., New York City

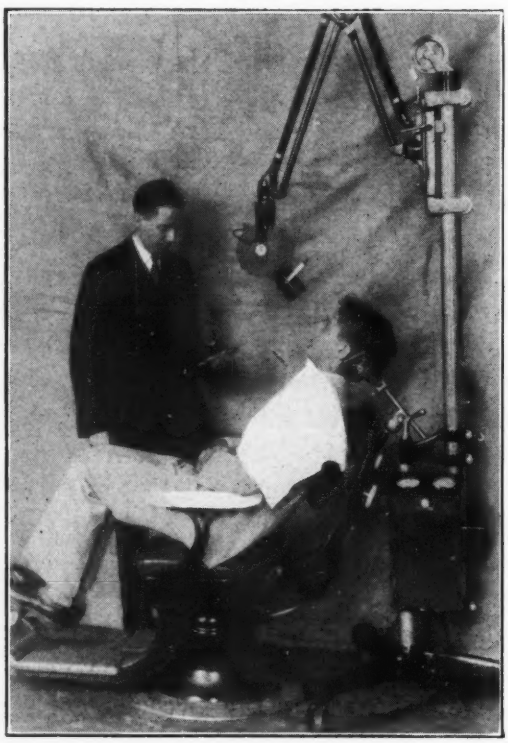

Fig. 1.—Showing patient seated in dental chair, Waite & Bartlett Solace Radiographic Unit with oil immersed tube in position and radiographer holding automatic time switch in the act of making an exposure. The unit is rolled away from the dental chair after exposures are made.

*Read before the First International Orthondontic Congress.

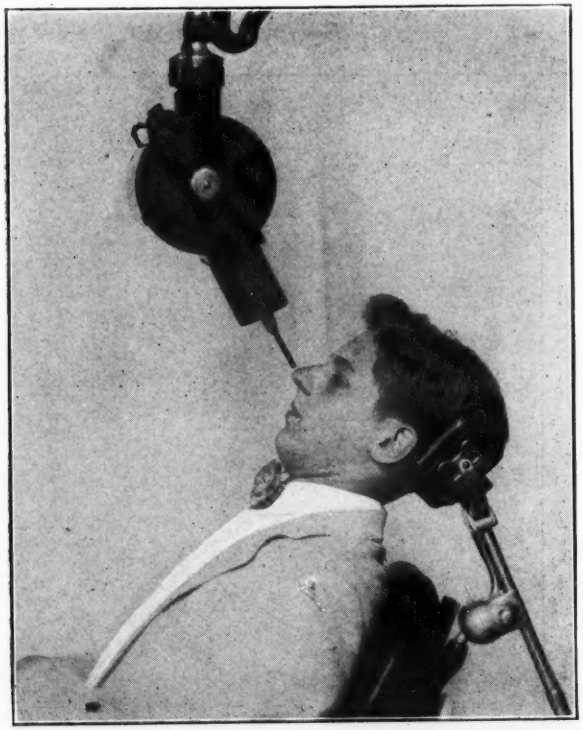

Fig. 2.—Showing the pointer swung into position to serve as a guide for the direction of the rays and to insure a uniform distance from the face. After the tube is positioned, the pointer is swung out of the path of the rays. This procedure is repeated with each positioning of the tube.

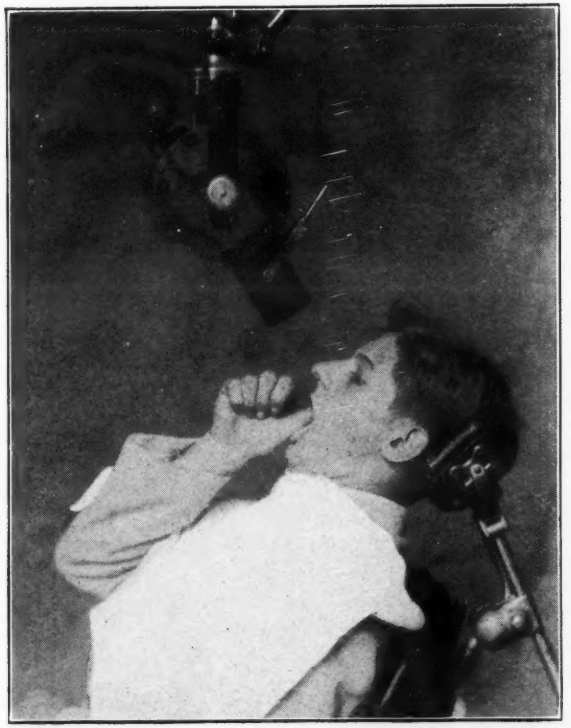

Fig. 3.—Showing pointer swung out of the way and the tube properly placed to radiograph the maxillary incisor region.

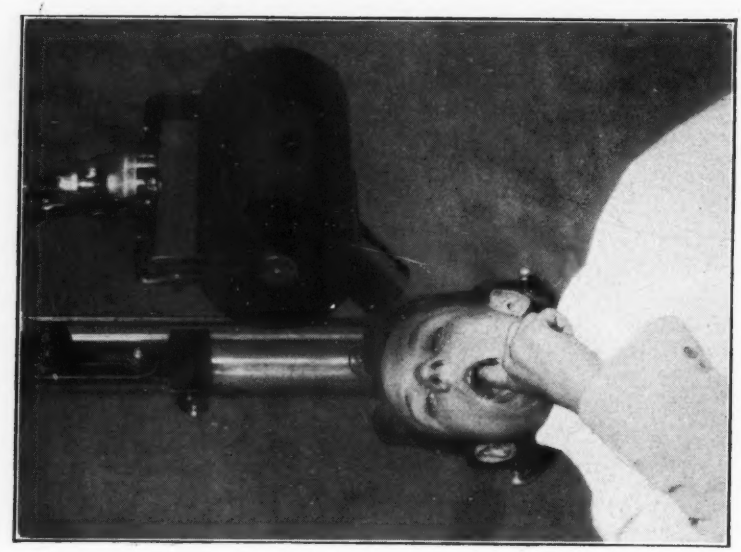

Fig. 5.—Tube placed for left maxillary canine and premolar region.

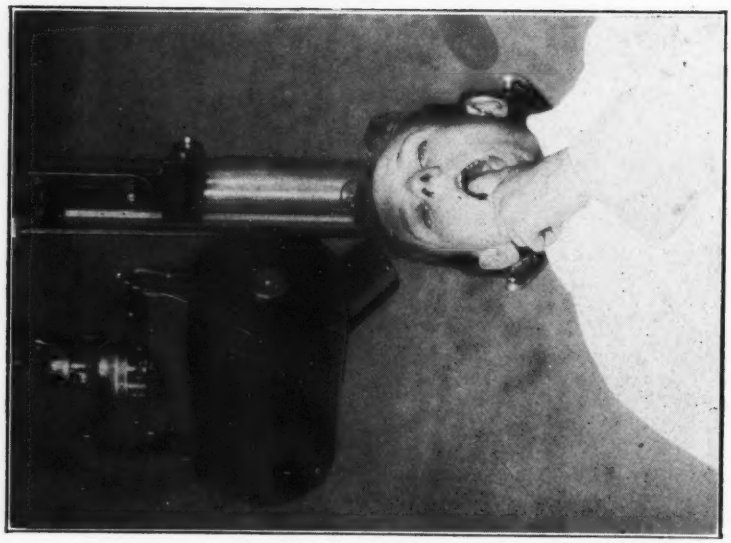

Fig. 4.—Tube placed for right maxillary canine and premolar region.

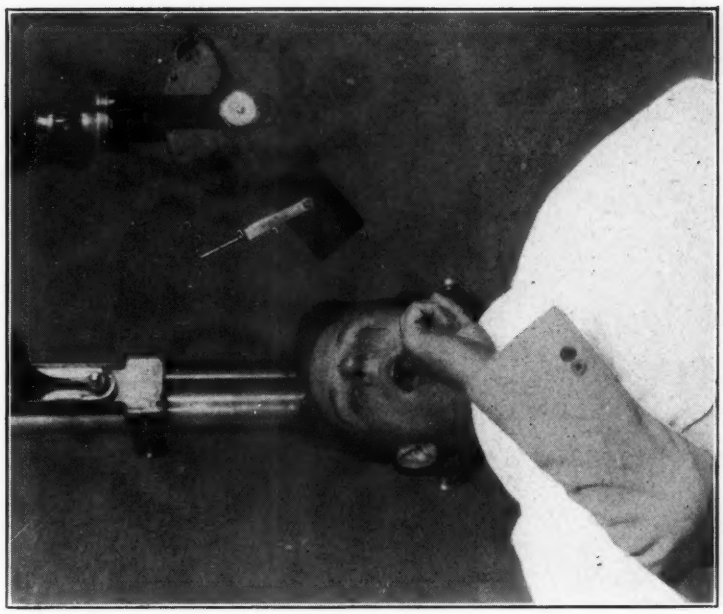

Fig. 7.—Tube placed for left maxillary molar region.

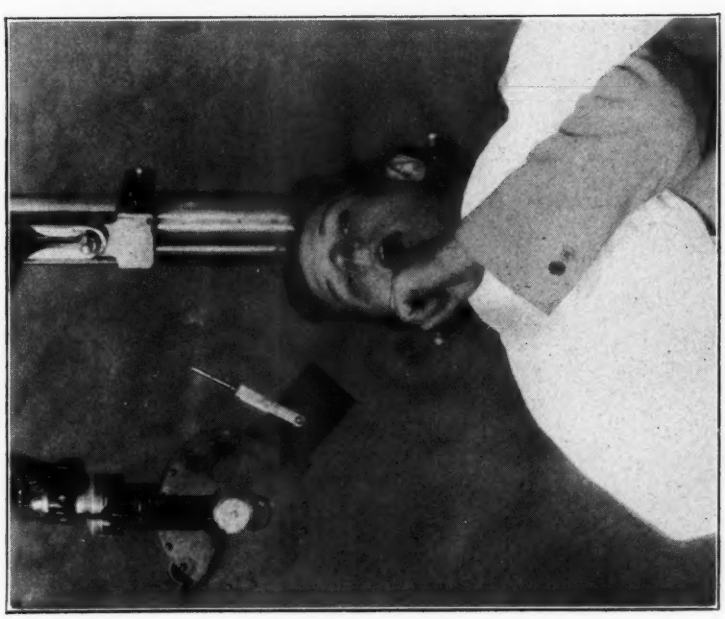

Fig. 6.—Tube placed for right maxillary molar region.

Fig. 8.—Showing pointer as used for positioning for mandibular regions. After the tube is positioned, the pointer is swung out of the way.

Fig. 9.—Tube placed for mandibular incisor region. Pointer swung out of path of rays.

Fig. 11.—Tube placed for left mandibular canine and premolar region.

Fig. 10.—Tube placed for right mandibular canine and premolar region.

Fig. 13.—Tube placed for left mandibular molar region.

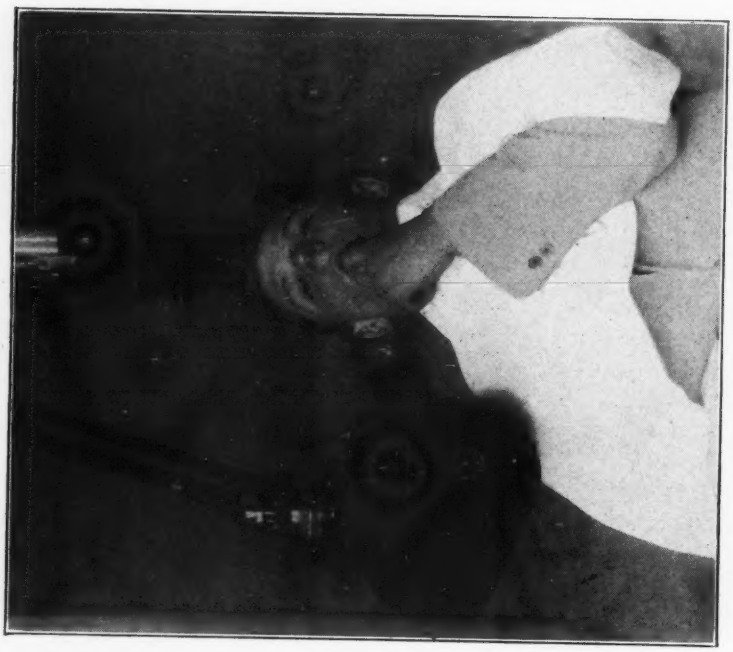

Fig. 12.—Tube placed for right mandibular molar region.

Fig. 15.—Tube placed for submaxillary view.

Fig. 14.—Tube placed for occlusal view. Large size film is held between the teeth.

Fig. 16.—For extraoral view. Tube placed for lateral view of left side. The premolar and molar regions of the left side will show without superimposition of tissues of opposite side of the mandible. The casette holds a 5x7 inch film, the lower half only being now exposed, the upper half being covered by a sheet of lead.

Fig. 17.—Extraoral view. Tube placed for lateral view of right side. The half of the film previously exposed for left side is now protected with the lead sheet and the unexposed half is now used. Thus both sides are shown on a 5x7 inch film or plate.

For quick and easy routine radiograms, especially of children under eight years, only four exposures are necessary for a preliminary examination, namely, two extraoral lateral plates as in Figs. 16 and 17, and two intraoral anterior films as in Figs. 14 and 15. Additional exposures must be made of any questionable areas from, at least, three angles.

ABSTRACT OF CURRENT LITERATURE

ORTHODONTIA — ORAL SURGERY — SURGICAL ORTHODONTIA
DENTAL RADIOGRAPHY

By Dr. Edward Preble, New York City

NUTRITION AND PEDIATRICS

By Dr. Samuel Adams Cohen, New York City

It is the purpose of this Journal to review so far as possible the most important literature as it appears in English and Foreign periodicals and to present it in abstract form. Authors are requested to send abstracts or reprints of their papers to the publishers.

Orthodontia, Oral Surgery and Radiography

Leucoplakia Oris. H. Prinz (Philadelphia). The Dental Cosmos, July, 1928, lxx, No. 7.

A study of this affection by a stomatologist should be instructive, since most of our knowledge comes from the angles of the dermatologist, syphilographer, and cancer surgeon. The author does not subscribe to the view that we are still ignorant of the causation, for it occurs in men in 95 per cent of all cases, and when women do contract it, we almost always find the habits, etc., which favor its development in males. We may, therefore, look on it as due to irritation. However, it hardly occurs in full blooded negroes which shows a deep-seated predisposition of some sort. Abuse of tobacco which serves to cause its appearance in white men and even white women and mulattoes is insufficient to produce it in the black. In addition to the action of the tobacco, per se, heat also plays a rôle and patches develop at times in smokers' burns, while water cooled pipes are much less injurious than heated ones. A certain contradiction is seen in sex and race, for there is more lip cancer in negress smokers of pipes than in white women in general. Irritating teeth, prosthetic apparatus and false dentures have been shown to cause leucoplakia, especially vulcanite plates. Amalgam fillings have even been held responsible in a few cases. But the individual irritants known to cause the affection in rare cases are so numerous that we must desist from this enumeration. Almost a general law may be set up to the effect that it is not so much the quality as the quantity of the irritation, that is, the irritant must be more or less continuously applied to the mucosa of the lip, cheek, and tongue. The three basic forms of leucoplakia are in reality three stages—the flat, the elevated and the verrucous. The article will be continued in the next number of the journal.

Mottled Enamel. F. S. McKay (New York). The Journal of Dental Research, June, 1928, viii, No. 3.

The author in seeking to throw light on the nature of this condition, investigated the teeth of certain Italians, who inhabit the littoral, which

are at times the seat of an abnormality known as "Chiaie's teeth," the dentist of that name having been the first to recognize it. The same has often been seen in Italians who have emigrated to the United States. The condition is really a mixture of several different affections. In Pozzuoli, a suburb of Naples, the natives are subject to a special enamel defect known as black teeth which formerly prevailed more generally in the vicinity but seems to have disappeared with a change in the drinking water, so that children no longer have it. On the other hand in another suburb known as Resina, mottled teeth were said to be very common. The author who visited this locality found that the inhabitants were still using well water while in neighborhoods using aqueduct water the children become immune. This is about as far as the research has extended, the author contenting himself with taking numerous photographs of natives' open mouths which show small black spots on otherwise normal teeth, the back as well as the front teeth exhibiting them. The old belief that these discolorations come from contact with volcanic gases may perhaps be brought into harmony with the newer view of some offending substance in the water, the suburb of Resina lying above ancient Herculaneum which was deeply buried in lava. There appears to be no immunity, for every individual who used well water during the enamel growing period presented the mottling. Be this as it may the same teeth have been met with in Holland where no such soil exists, in the Arabs of Northern Africa and even in a Borneo orang.

Suicide From Fear of Exodontia. Editorial in The Dental Surgeon, June 16, 1928.

A case is cited from the daily press in which an old lady of seventy-four years committed suicide by inhaling illuminating gas after a doctor had insisted that she must have her remaining teeth extracted. The hospital appointment had already been made. The verdict of the coroner's jury was suicide committed while of unsound mind. The editor states that unreasoning fear of dentistry is not uncommon and is by no means restricted to old women. The mental state is somewhat of a mystery because the fact of anesthesia should banish fear to a large extent. Study of these cases shows that this unreasoning fear is motivated largely by the fact that a large number of teeth are to be extracted, for we do not see it if but one or two teeth have to come out. It will also be found that there have been years of suffering from the teeth, so that the patients feel that they simply cannot go through any more anguish and prefer death. Logic and common sense cannot influence these phobic states. The editor does not mention the similar cases in which patients fear major surgery and sometimes resort to suicide, especially in cases in which one or more operations have already been undergone. Opposed to this mental state is another in which the patient, in submitting to a desperate operation, is influenced by the conception that a postoperative death will be an easy solution of a dilemma. Possibly if mass extraction were a major operation with only an even chance of recovery the patient might view the outlook with greater equanimity. The editor connects this phobia, and he might have added especially in the aged, with

the traditionary fear of pain dating from the preanesthetic era, especially perhaps when the patient must be interned in a hospital, another source of traditional fear.

Nutrition and Pediatrics

Acute Osteomyelitis of the Superior Maxilla in Young Infants. Murray H. Bass. Am. Jour. Dis. Child., 1928, xxxv, 1.

Bass gives an excellent clinical picture of acute osteomyelitis of the superior maxilla in young infants, and reports two cases in detail. The disease, which occurs in infants from two weeks to nine months, is characterized as a rule by redness and swelling of the lids and periorbital tissues of one eye in an otherwise healthy infant.

The orbital swelling may increase to such an extent as to give rise to an exophthalmos. A thick purulent nasal discharge may appear on the affected side.

The oral condition presents a very interesting picture. Along the upper gum, swellings are noted usually in the canine area, or the swelling may be seen anywhere on the hard palate.

These swellings may rupture spontaneously if they are not incised. The discharge, which is of creamy pus, contains particles of bone and unerupted teeth. Judging from the literature, the discharge of unerupted teeth is very characteristic of this condition. The infant appears sick and toxic, and because of nasal obstruction, has difficulty in nursing. Anorexia, irregular elevation of temperature, and perhaps convulsions are other important features of this condition.

The outcome is either fatal (the literature reports a mortality of 25 per cent) or healing with or without a persistence of a discharging sinus or the development of some secondary foci.

The discharge of the teeth leaves the child without teeth over the affected area.

Prevention and Treatment of Thrush (Oidial Stomatitis). Harold H. Faber and Esther B. Clark. Am. Jour. Dis. Child., September, 1927, iii, 34.

The authors describe in careful and minute detail their experience with a small epidemic of thrush in a nursery in San Francisco. To combat the epidemic, all known precautions of asepsis were religiously practiced such as adequate sterilization of all nipples, bottles and solutions entering the infants' mouths and of all clothes and bed linen; in spite of meticulous cleanliness in handling the babies. In spite of rigid avoidance of washing or otherwise touching the inside of the babies' mouths and in spite of careful washing of the mothers' breasts before nursing (although this is admittedly an inadequate procedure) and expressing and discarding the first few drops of milk, cases of thrush continued to break out.

After exhausting every known source of contamination the authors found an accumulation of dust which was difficult to reach in the routine cleaning. Removal of these dust deposits was immediately followed by a cessation of the epidemic.

The authors also tested and report on the therapeutic value of boric acid, alkalies, formaldehyde, mercurochrome-220 soluble, and gentian violet. The experiments show clearly that boric acid even in saturated solution does nothing more than inhibit multiplication of Oidium Albicans, and that the organism readily survives exposure to such solutions for considerable periods of time.

They protest against the use of boric acid solution for the purpose of cleansing the babies' mouths. As far as the growth of Oidium Albicans is concerned, little or no favorable results were noted with alkaline solution in the local treatment of patients with thrush. The authors feel doubtful regarding the efficacy of formaldehyde as treatment for thrush.

The dyes seem to be ideal for the treatment of patients with thrush in that they are penetrating with minimum toxicity. From the experience of the authors and others, gentian violet, in preference to mercurochrome-220, has given the most satisfactory results in the treatment of thrush.

Treatment should be given at least one hour after feeding. The mouth should be gently cleansed with several cotton swabs to remove the adherent mucus over the affected areas. The dye, in 1 per cent aqueous solution, must be freshly prepared (not more than a few days old) and must be applied generously, first to the affected area and then over the tongue and in the buccogingival folds. The treatment must be repeated once or twice daily for at least three successive days, and every other day thereafter for from one to two weeks. The lesions will have nearly disappeared by the second day and entirely so by the third. In spite of the deep staining of the entire oral cavity, which persists for a day or two after treatment has been stopped, there is no apparent interference with the baby's appetite or ability to feed. Stain on the lips or chin can easily be removed with a little alcohol. The stools during treatment often appear purplish.

Observations on the Effects of Oral Sepsis in Children. Philip G. Capon. The Dental Record, April, 1928, xlviii, 4.

The author states it is peculiar that little research and clinical study appear to have been done on the effect of oral sepsis in childhood. He feels that oral sepsis is of greater significance in the child in view of the child's vulnerability, in comparison with the adult, to infection in the alimentary system, tonsils, pharynx, and associated parts.

It is not beyond the bounds of possibility that certain chronic diseases found in the adult might not have originated from chronic oral sepsis persisting through childhood.

Capon quotes Colyer, who states that the constant association of oral sepsis with tuberculous glands is an indisputable and important fact, and also Bulling, who states that infection of lymph nodes may disappear with the removal of the primary focus, or it may present activity as a new focus in the production of systemic disease, or the infection of the node may become permanently latent.

From his own clinical records the author reports of instances of infection of the eye, disorders of digestion, and functional nervous disorders which have been benefited to a marked degree by the eradication of oral sepsis.

Mikulicz's Syndrome. Alexander J. Schaffer and A. Wilmot Jacobsen. Am. Jour. Dis. Child., September, 1927, xxxiv, 3.

The authors present a report of ten cases, six above fourteen years of age and four under fourteen years, seen in Johns Hopkins Hospital since 1910. Almost fifty years ago, Mikulicz reported a case of chronic, bilateral, painless enlargement of the salivary and lacrimal glands, for the cause of which he could not advance an adequate explanation, but which he believed to be a low grade infection.

Since no etiologic agent could be discovered in four of these ten cases, only these could come under the heading of Mikulicz's Syndrome. In these four cases, however, a history of primary syphilitic infection was obtained in two patients, and the blood serum of the third gave a positive Wassermann reaction. Nevertheless, the authors do not attribute the syndrome complex of these three cases to syphilis.

In mentioning the literature the authors quote others who have also found syphilis in patients having this syndrome. Moreover. quite a few German observers believe that in regard to Mikulicz's Syndrome tuberculosis is the sole etiologic agent.

In discussing the pathology the authors state that in those cases for which no etiologic factor can with any degree of assurance be found, the so-called Mikulicz's disease proper, the pathologic picture resembles one or other of two types. Either one finds an increase in the lymphoid elements in the glands, or, rarely, a hyperplasia of the connective tissue elements, with ultimate diffuse scarring. The latter is by many considered the end-stage of the former. The finding of these two types of reactions has given rise to the difference of opinion as to the etiology of Mikulicz's disease proper, some holding with Mikulicz that it is a chronic inflammation; others that it is a benign newgrowth.

The authors suggest a new classification for cases presenting a chronic bilateral enlargement of the salivary and lacrimal glands. These cases divide themselves into two groups, the symptomatic and idiopathic or Mikulicz's disease proper.

The complete classification is as follows:

I. Mikulicz's Disease
   - A. Familial
   - B. Mikulicz's disease proper

II. Mikulicz's Syndrome
   - A. Leucemia
   - B. Tuberculosis
   - C. Syphilis (?)
   - D. Lymphosarcoma
   - E. Toxic
     1. Lead
     2. Iodides, etc.
   - F. Gout (?)
   - G. Febris uveo-parotidea subchronica

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EDITORIALS

We Approach an Era of Extraction

ABOUT 1900 we heard very much about the so-called "New School of Orthodontia." Some men contended there was no such thing as a new school while others were willing to be classed as members of the new school. An analysis of this grouping revealed the so-called "New School of Orthodontia" was greatly opposed to extraction of teeth for the correction of malocclusion. This was because a certain number of other men were extracting teeth for the correction of malocclusion. After considerable discussion the extraction of teeth became less and less, and even some of the men who in early days were referred to as advocates of extraction for the correction of malocclusion, took a different view of the subject.

With the advent of the x-ray and certain plans of treatment, we find a few men who are turning toward the extraction of third molars for the cor-

rection of malocclusion. A very lengthy paper which was read before the American Society of Orthodontists in Chicago, several years ago, was discussed by Dr. Case who stated in a humorous way, that he had often been referred to as a member of the old school and a radical extractor, but he thanked God he had never extracted as many teeth as were doomed for extraction by the essayist who presented the paper.

Since the presentation of that paper, we find an increasing number of men have been justifying extraction of teeth for the correction of malocclusion. Of late years we find another group has sprung up and during the last few years, we have seen a number of cases treated by the followers of this system where extraction had been resorted to. We are now treating a number of these cases opening up spaces and replacing missing teeth with artificial substitutes. In all of these cases we found the extraction was justified by the operator because he had attempted to diagnose the condition according to Simon's gnathostatic system.

Simon's gnathostatic system may have a great many advantages, but a great amount of harm is being done because inexperienced operators are justifying their acts by Simon's teachings. We realize in a great many instances, more experienced men in the use of Simon's system, would not have extracted. However, the unfortunate situation remains that Dr. Simon contends extraction is necessary in certain cases; and because of faulty technic and inexperience, men are producing a great amount of harm at the present time.

We find another group of individuals who are resorting to extraction because they contend that the osseous support of the teeth cannot be developed beyond its inherited size. They do not tell us how we are to know what the inherited size of a face is or should be. They are also justifying their acts on the supposition that bone cannot be developed as a result of mechanical stimulation and function. They probably do not possess a good knowledge of the growth and development of the teeth and the importance of the development of the mandible and maxilla as a result of growth of the alveolar bone. To these individuals we recommend that they carefully study the work of Dr. Brash as recently published in the *British Dental Journal* and also in the INTERNATIONAL JOURNAL OF ORTHODONTIA, ORAL SURGERY AND RADIOGRAPHY.

In conclusion, we have at the present time three groups of operators who are resorting to extraction; namely, those who base their opinion on the x-ray examination, those who follow Simon's system of diagnosis, and those who are unable to appreciate histologic development of bone as a result of mechanical stimulation. We hope these three groups of operators can be checked before the orthodontic profession is plunged into an unfortunate era of extraction.

ORTHODONTIC NEWS AND NOTES

First District Dental Society State of New York

The Fourth Annual Meeting for Better Dentistry of the First District Dental Society will be held at the Hotel Pennsylvania, New York City, December 3, 4, 5, 6, 1928.

The Committee has added a full day to the meeting this year, therefore there will be five clinic sessions, three general lecture sessions and one session devoted to lectures of the four Sections of the First District Dental Society.

The same plan of subscription will be continued, namely, $5.00 admits a member to all sessions.

Among our essayists and clinicians will be, Dr. C. N. Johnson, Chicago, Ill., Dr. Robert R. Gillis, Hammond, Ind., Dr. Robert H. Ivy, Philadelphia, Pa., Dr. Benjamin Tischler, Boston, Mass., Dr. Raymond A. Albray, Newark, N. J., Dr. John G. Logan, Portage, Pa., and Dr. Percy R. Howe, Boston, Mass.

There will be a manufacturers exhibit under the auspices of the Manufacturers Club of the American Dental Trade Association and Independent Dental Manufacturers Association in the hotel during the meeting.

Address all communications relative to subscriptions, clinics, etc., to E. M. Davies, 2 East 103rd Street, New York City.

John T. Hanks, Chairman of Committee.

St. Louis Study Club of Dentistry

The St. Louis Study Club of Dentistry, organized in 1919 for the purpose of teaching advanced dental subjects to ethical dentists, without charge, will open its eleventh annual term on Wednesday, October 3d, 1928. The sessions will be held from 8.00 to 10:00 P.M. All classes are to be given in the Dental Department of the St. Louis University.

The following subjects will be covered during this term:

Dental Roentgenology
Fixed Bridgework
Full Dentures
Dental Ceramics
Conduction and Local Anesthesia
Rizadontia
Operative Dentistry
Dental Economics
Clinical Dental Prophylaxsis
Anatomy and Dissection of the Head
Oral Diagnosis and Diseases of the Mouth

Bulletins, giving detailed information regarding the Study Club and its courses, may be had by addressing Dr. Frank C. Rodgers, 309 Wall Building, St. Louis, Mo.